



# THE LEADING EDGE

NEWSLETTER OF MUROC EAA CHAPTER 1000

Voted to Top Ten Newsletters, 1997, 1998 McKillop Award Competition

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<http://www.eaa1000.av.org>

October 1999

Chapter 1000 meets monthly on the third Tuesday of the month in the USAF Test Pilot School Scobee Auditorium, Edwards AFB, CA at 1700 or 5:00 PM, whichever you prefer. Any changes of meeting venue will be announced in the newsletter. Offer void where prohibited. Your mileage may vary. Open to military and civilian alike.

## This Month's Meeting:



### HOMEBUILDER'S DOWN DAY

In response to the outstanding success of EAA Chapter 1000 at the Edwards Air Force Base 1999 Open House (13 aircraft flown in and about 300 Young Eagles signed up), the **Kommandant** has declared an **EAA Chapter 1000 Down Day** from 1700 to 1900 on **19 October 1999**. And since we know how to goof off better than the government, not only is time off granted to military members, but civilians and contractors will not be charged leave either. Members are expected to use this time working on their projects, being with their families, or doing some other activity they find enjoyable. Members of the **Project Police** may be checking up on you.

Watch for a report next month, as this event was still in progress at press time.

### The Project Police Infiltrate Golden West Fly-In

An esteemed and highly trained group of **PPOs** were called upon to form a **Project Police Tactical Assault Force (PPTAF)** for purposes of investigating the second annual Golden West EAA Regional Fly-In. Okay, so it was the same old group of board members, but go along with us for the purposes of the story. **Gary Aldrich**, **George Gennuso**, and **Russ Erb** set out early in the morning on 11 September 1999 from their not-so-secret base of operations at Fox Field for the former Castle Air Force Base in the mighty VC-180 Fighting Skywagon.

As the fly-in was being held near the territory of **EAA Chapter Det 11**, this **PPTAF** called upon the members of Det 11 to provide support and local knowledge of the site to improve the chances of success. **Norm Dewitt** was able to infiltrate to the core of the organization posing as an air show performer in his black Christen Eagle, brought out of retirement while the Edge 540 undergoes a factory rebuild.

**Ed Dutreaux** flew in as a mild-mannered EAAer in his RV-4 N444ED.

Keeping with standard **PPTAF** procedures, the main **PPTAF** had not made any arrangements to link up with the Det 11 team. This non-planning served the dual purpose of enhancing mission security and being less work. The **PPTAF** wandered semi-aimlessly toward the center of the fly-in when they were spotted in their smashing black uniforms by Norm, who had so successfully penetrated the organization as to get them to provide him with a staff car (or at least permission to drive on the flight line, we're not sure which). Almost immediately thereafter we were joined by Ed, within 100 feet of N444ED. We would have seen his airplane if we had just looked in the right place. At this time, we were interrogating **Carol Hoey** of Chapter 49 by her BD-4. She told us that **Bob Hoey** was in the area talking to **Tony Ginn** and they were about to depart.



The 1999 Golden West EAA Regional Fly-In Project Police Tactical Assault Force Ed Dutreaux, George Gennuso, Norm Dewitt, and Gary Aldrich. Russ Erb is hiding behind the camera.

Norm set about his critical mission of waiting by his airplane for three hours waiting for the fuel truck to show up, while the rest of us proceeded on to investigate the rest of the assembled masses.

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The remainder of the **PPTAF** proceeded on, wading through the usual chaff until finding a truly historic find. The Piper PA-12 Super Cruiser "City of the Angels" was one of two PA-12s to fly around the world in 1947. We had seen this airplane at Sun'n Fun, and now it was here on the other side of the country.



**Restorer David M. Liebegott and owner Harry P. Mutter smile with glee at the PPTAF gives the "City of the Angels" an enthusiastic "Thumbs Up"**

After such a find, the **PPTAF** eventually decided it was time to check out the lunch fare. The **Kommandant** broke with tradition by NOT having the Philly Cheese Steak Sandwich. We continued to scan the assembled masses for any known friendly faces. We spotted **PPO John Goldenbaum**, who was wearing his red Poly Fiber shirt, not his **PPTAF** uniform. He stopped by to see us, and bestowed upon us the honor of finally meeting his lovely wife **Phyliss**.

We also spotted **Victoria Rosales** of Chapter 49, who gave us critical intelligence that the **Vice Grand Poobah for Chapter Stuff Bob Mackey** had been spotted hanging out at the EAA Merchandise tent. After finishing round one of lunch, we set out for this location and eventually got there. Bob saw us coming, and in a despicable move tried to hide behind a human shield. We rooted him out and forced him to participate in an enjoyable discussion. We also saw **Claudette Colwell**, one of our favorite members of the EAA Chapter Advisory Council.

After collecting the latest poop from HQ, we proceeded on through more of the exhibits. We found Victoria with husband **Paul Rosales** at the Van's Aircraft booth, where they were spelling the sole rep from Van's so that he could have some lunch.

We caught some of Norm's airshow, and, of course, we passed through the vendor tents to see what was being hawked. Ed learned the truth about the statement that saying anything or asking anything of a vendor would launch him into his pre-arranged marketing spiel. *Gadgetosis Nervosa* reared its ugly head. Gary flight tested a new set of sunglasses, which looked like not much more than a sheet of plastic and a string, and eventually bought them. George finally bought an Active Noise Reduction headset.



**The PPTAF with Victoria and Paul Rosales by the RV-8A**

After the airshow, we watched the immediate mass exodus as they all sat, engines running, not going anywhere. Eventually we said our goodbyes to the Det 11 squad and climbed back into the Fighting Skywagon. Many interesting stories of days gone by were swapped, and after bedding down the Skywagon we had dinner at the Way Out Inn. The **PPTAF** then disbanded and dispersed back into the population, to form up again as duty called.

- Erbman

## And From Det 11...

It was great to run into you, Gary, and George last weekend. I wish I could have spent more time with you guys. Instead, I waited by my plane for gas for 2 hours. At least the weather cooperated this year.

On Sunday, I had the opportunity to fly in the Turbine Legend. Boy, was that a neat flying machine. It reminded me, in some ways, of my flight in your F-16 at TPS. You are pinned in the seat on takeoff by the acceleration. It breaks ground at 80 mph. Best rate of climb is about 150 mph, and we were indicating 5500 fpm (not exactly F-16 like, but the fuel flow wasn't either). Stick forces and roll rates were similar to the "16". The plane is stressed to +6/-4 G's. We had 230 kts IAS at 7000 feet, but I couldn't determine the power setting. The plane fits right into normal general aviation traffic patterns, assuming the pilot doesn't bust in at 230 mph. We used 100 mph in the pattern down to short final. Touch down was slightly above the 61 mph stall speed, and there is beta if you wish to shorten the rollout. It's a really neat plane. I think I may "need" one.

Finally, as promised, my new web site is at:

[www.geocities.com/Pipeline/Cliff/1211](http://www.geocities.com/Pipeline/Cliff/1211)

Really kool address, huh? Have a great Open House, and I hope to see all of you in the near future.

Best wishes,

- Norm DeWitt

Last Month's Meeting

EAA Chapter 1000

MOL Room, Test Pilot School, Edwards AFB
1700, September 21, 1999
Gary Aldrich, Presiding

We had the meeting and had a good discussion of hose quick-disconnects. Secretary Bowen has promised to tell us more about it next month.

The Prez Sez...

After the excitement and effort expended on the Edwards Open House, compounded by flight planning for a college hunting trip with his daughter the next day (how hard can they be to find? It's not like they're on mobile launchers or something) the Kommandant is suffering a severe deficit of brain bytes. He thinks that this should decry his lack of fitness for the job and demand his recall, but we don't let him off that easy.

In any case (including this one), the Kommandant wishes to officially thank the Open House Booth Crew, including Russ Erb, Doug Dodson, Gail Dodson, George Gennuso, Norm Howell, Gretchen Lund, and Paul Rosales of Chapter 49.

- Per Gary Aldrich, Kommanding

New Members

As a result of the Edwards Open House, we are welcoming three new members to Chapter 1000. First up is Tom Hallendorf, who joins us at our Det 11 location (San Carlos CA). You may think you have already met Tom, and maybe you have. Tom has been flying in to the Edwards Open House for several years now, and designed and built the "Super 6," sort of a rocket-ized IO-540 modification of the RV-6, as covered in a article by Budd Davisson in the December 1998 issue of Sport Aviation. Tom lives with his wife Janie in Woodside, CA, where he supports his airplane habit working as a real estate developer. He has also built an RV-4, and lists his current project as Classified SECRET PPYDNTK (Project Police You Don't Need To Know). We'll show him—we'll wait until he finishes it and can't wait to show it off.

We welcome another Glider Guider to our fold in Murry Rozansky. Murry lives in Chatsworth with his wife Louise, but is frequently seen at Mountain Valley Airport in Tehachapi flying gliders. In fact, he served as an excellent distraction during your NLE's checkride by entering the same pocket of lift (properly, of course) at about the same altitude. Murry has been an EAA member for quite some time, having a 5 digit EAA number. He holds certificates for Airplane Single Engine Land, Airplane Single Engine Sea, and Glider. He lists his projects and interests as many paper airplanes and auto engine conversions. He supports his airplane habit by working as a Mechanical Design Engineer.

Dave Morgan (call sign "Smash") has finally given in to peer pressure. Working as a Flight Test Engineer (FTE) on staff at USAF TPS, he joins the chapter to complete our first stage of takeover—namely all of the FTEs on staff at TPS (Dave, Russ Erb, Doug Dodson, Gary Aldrich) are members of EAA and Chapter 1000. Smash joined up when he heard about the Young Eagles program and asked how he could get in on taking kids for rides. He and his wife Lisa live on Edwards. We keep him busy developing new courses and flights for the expanding systems phase of the curriculum and by "forcing" him to fly in F-16s, C-12s, and all of the other TPS aircraft. He has already upgraded to a Private Pilot Airplane certificate along with Commercial Pilot Glider and is rapidly working his way toward a CFI-G.



Young Eagles Update

Fox Field, Lancaster, September 18, 1999

Beautiful day for an old fashion fly-in and Young Eagle's Rally!!! We had great weather, lots of airplanes, plenty of ground crew, just the right number of Young Eagles. We had lots pilots ready to help out, but since I wanted to keep this rally small, only 4 actually flew YE's. Many thanks to Ron Wilcox for attending the planning meetings for me over the past few weeks. Also, it was great to have Russ Erb, the world famous Young Eagles software author, on hand to print out certificates - thanks Russ!!! For those of you reading this in the Chapter news letters, if you are not on my e-mail notification list and would like to be, please send me an e-mail at: rv6@cybersurfers.net.

The totals for this rally are as follows: 4 pilots, 3 ground volunteers, and 18 Young Eagles.

Ground Crew:

- Herb Carlson Post-flight certificates and pictures
Russ Erb Computer wizard
Victoria Rosales Pre-flight registration

<i>Pilots:</i>	<i>Equipment:</i>	<i>#YES</i>
Lane Carlson	Cessna 172	7
Ed McKinnon	Mooney 231	7
Space Miller	Cessna 172	3
Gary Trippensee	Luscombe 8A	1

Young Eagles this Rally: 18

Young Eagles this Year: 222

Young Eagles Grand Total: 2518

**Reminder Reminder Reminder!!!**

October rally will be at **ROSAMOND** on the **16th** - see you there!!!

Please note my new e-mail address: **rv6@cybersurfers.net**. I will be using this for all future YE business.

- David McAllister

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## The Excalibur Story

### The Story Behind the Machine

It all started when I received my first aerobatic ride in a Pitts S2B. It was the mid 1980's and I was introduced to aerobatics by Glenn Maben. One day we took a trip to Olean NY where we each received (paid for) a ride (instruction) with Bill Thomas--an exemplary aerobatic instructor. Glenn had already been flying a Decathlon for many years but this was my first adventure into the world of aerobatics. At \$120 per hour I wasn't going to wait long to get 100% immersed into this sport and I told Bill to forget the easy stuff like wingovers and stalls and get into the real stuff like rolls, loops, snap rolls, hammerheads, and inverted spins. I know he was watching to see if I was about to turn green but I never did; I was having too much fun. I was hooked on aerobatics; I couldn't get enough of it! Unfortunately, I didn't have an aerobatic aircraft of my own nor could I afford to rent one.

I had been building a KR-1 for several years and it was within a year of flying. Unfortunately, after that aerobatic demo ride in the Pitts, every time I looked at the KR-1 all I saw was an airplane that I knew I'd be dissatisfied with. When I couldn't stand it any longer, I started looking for alternatives. That's when I saw the Corby Starlet. It was in the Wicks catalog and it was a little strange looking but the more I studied it, the more it grew on me. It used a VW engine and, conveniently, I already had a VW engine with an engine mount. The wheels and brakes could come off the KR-1 too; they'll work just fine. I figured all my major expenses were transferable so there wasn't much of a loss if I destroyed the KR-1. I took the chain saw to it and that was the end of the KR-1. A Corby Starlet was in my future.

I sent away for the info package in 1987 and perused it for about a year. I had just joined the US Air Force and I hadn't exactly settled into my first assignment until early 1988 so I just kept thinking and studying the info pack. The only thing that disturbed me was the  $\pm 4.5g$  limit on

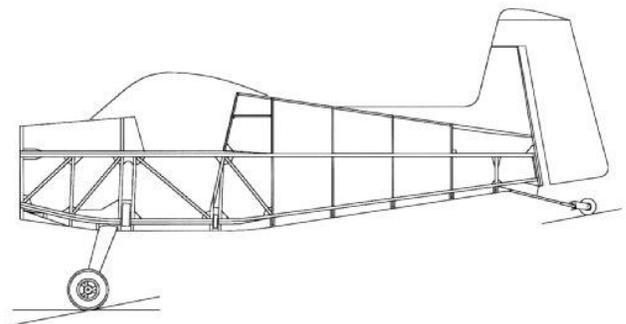
the airframe. I committed myself to the Corby Starlet anyway and bought the plans. Studying them, I found some of the answers to my questions regarding the stress limits on the Starlet. First off, the wooden wing spar didn't provide much safety margin when one considers the FAR Part 23 standard for aerobatic category airplanes. They need to be designed to a limit load of +6 and -3 g's with a factor of safety of 1.5 giving an ultimate load of +9 and -4.5 g's. I clearly needed to evaluate the design with respect to my own personal requirements and I also knew it would be a big job. Little did I know just how massive the undertaking would be!

### Let the Games Begin!

The first step, of course, was to define my design requirements. They were as follows:

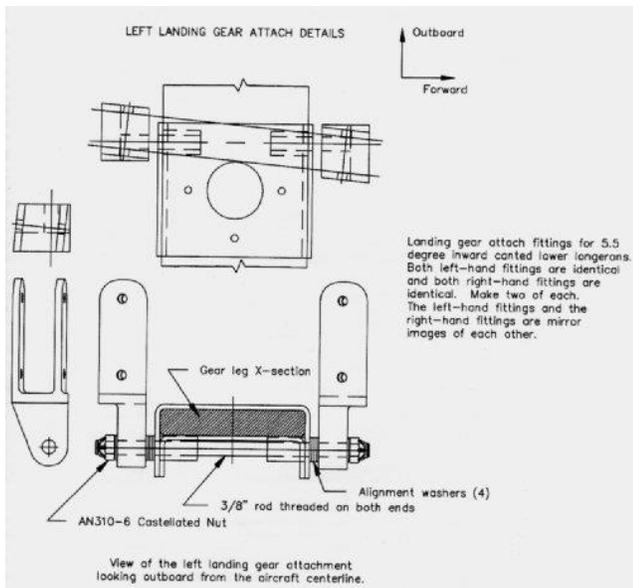
- $\pm 10 g$  design limit load at 750 lbs.
- More power...I planned to upgrade my 55 HP (1680cc) VW to the HAPI 82 HP monster after the first year of flying.
- Minimize the empty weight of the aircraft.
- Use more capable airfoils on all flying surfaces.

Before I started building anything, I had to get my design requirements into a set of working drawings. I wanted to retain as much Starlet as I could so I attempted to evolve the design instead of starting with a clean sheet of paper. Right off, I knew the bigger engine would add more weight forward of the firewall so I immediately added an extra 5" behind the pilot's seat. Moving the tail further aft would counteract the engine weight and give me more tail volume at the same time. I wasn't sure if I actually needed more tail volume because the original design had reasonable tail volumes to start with. In addition when I ran the calculations for tail damping factors, I found that Excalibur could be expected to have good spin characteristics. Also, based on Don Wilkinson's comments on the aerobatic capabilities of the Starlet as published in the Oct/Nov 1984 issue of *Corby Starlet Newsletter*, I was confident that Excalibur would also have good spin characteristics. (Flight testing will tell the real truth, however).



Since aerobatic loads impose severe torsional moments on the wing as well as bending moments, I felt it necessary to change the manner in which these torsional loads are reacted out of the wing and into the fuselage. I designed the wing to use an auxiliary spar just ahead of the ailerons and located a rear spar box to pick up the load behind the pilot's seat. This contrasts significantly with the Starlet's method of reacting the torsional loads via the D-tube leading edge and dumping it into the main landing

gear beam. Along with the second spar box, I put in the 2" stretch in the cockpit area and made other adjustments to ensure the CG would end up where I expected it to be. At this point I drew up a new fuselage. The wing would come later. My biggest concern was getting the hardest design work done first before I lost interest in it and a fuselage is definitely more difficult to design than a wing...believe me!



It took lots of brain scratching to find ways to keep the airplane light. One area was in the landing gear. Since I changed the manner in which the wing torsional loads are reacted into the fuselage, the only purpose for the original landing gear carry-thru beam was to bolt on the two-piece steel gear legs. If I didn't have a two-piece gear, I didn't need the landing gear beam. I decided to use a one-piece aluminum gear. The lower longerons were heavily gusseted forward of the main spar box for just that purpose and a "hinging" arrangement was devised that would prevent the gear from twisting the lower longerons into splinters.

One might think that the aluminum landing gear would be a lot lighter than the steel gear. This is a common misconception. Although aluminum is roughly 1/3 the density of steel, you end up using a lot more of it to get the required stiffness (or flexibility in the case of landing gear) while keeping the stress levels down to manageable levels. In order to have a higher working stress limit, I specified 7075-T6 in the manufacture of my gear. 2024-T3 would be heavier since the working stress levels must be lower and 6061 is downright unacceptable. One comment I have received from many people regarding my choice of 7075 is its notch sensitivity and brittleness. This is a valid point. However, if the gear is kept free from nicks, this is not a problem. Besides, steel leaf springs on your car or truck suffer from the exact same problem--which isn't really a problem is it? Overall, I'd say I saved roughly 5 pounds in the landing gear department on Excalibur.

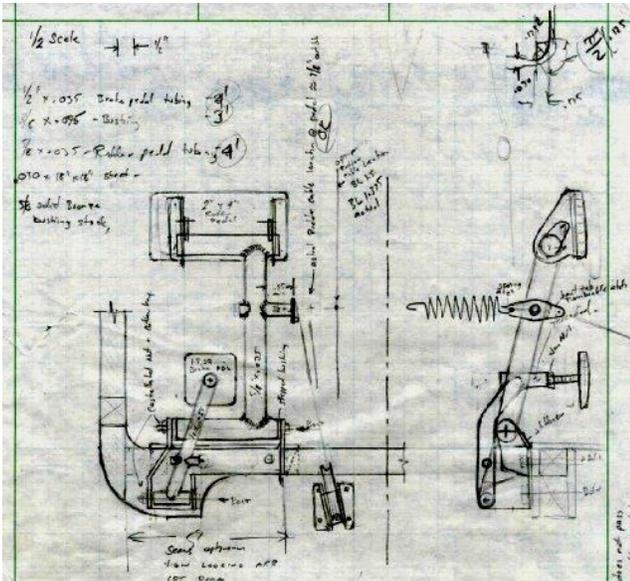
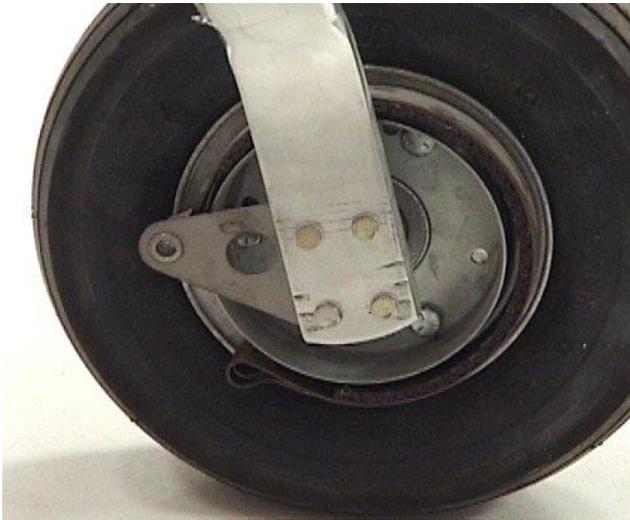


**Note:** While you're looking at the pictures, you should take note of a few things I did mostly for appearance. First, there are very few sharp corners in the fuselage. The lower corners of the fuselage are all rounded, for example, as are the inside corners of bulkheads and most cutouts. I wanted to give my airplane a level of craftsmanship that could be considered "show quality". Secondly, there is evidence of attention to detail everywhere on the airplane. Aluminum parts are generally polished and/or alodined, and steel parts are or will be painted white. Although I did these things more for the "show quality" aspect of it, I also wanted to force myself to make every attempt to keep the weight out of the airplane. Being a little "nit-picky" allowed me to do just that.

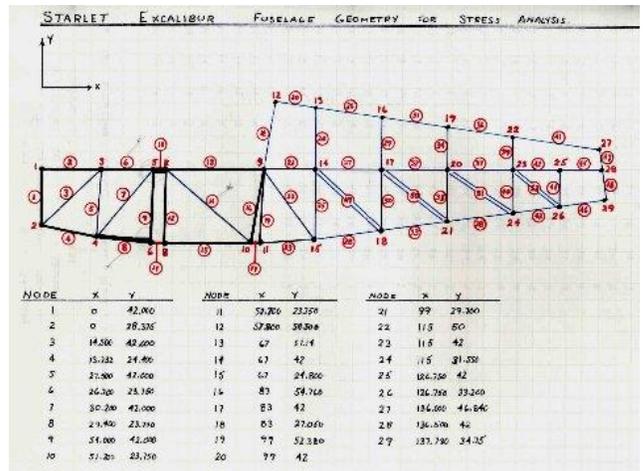
Having effectively eliminated about 5 pounds from the gear legs and mounting arrangement, I looked for other areas to save more weight. The next obvious would be in the wheels and brakes. I already had the Azusa 5" wheels from my KR-1 so I elected to use them. The Lamb tires fit perfectly! The mechanical brakes were retained after I saw the Pulsar arrangement. They use external band linings around the outside of the drum and are cable operated from heel pedals under the rudder pedals. At first I was skeptical about them but after trying out the brakes in the Pulsar, I deemed them adequate. In addition, I've heard few, if any, complaints about the arrangement from Pulsar builders who use them. Both the Pulsar and Excalibur have about the same gross weight and landing speed so without further consideration, I put them in my airplane. Right now I'll justify my decision based on the fact that it's too easy to add weight to the airplane by installing unnecessary items but it's extremely difficult to remove weight. So it's best to start out with the lightest solution available and work up

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from there. We'll see just how happy I am with them when I start taxiing the airplane around under its own power.



What's next...the tailwheel? Sure thing! A couple of Pitts drivers I know say the Haigh tailwheel is the only way to go. They say it makes driving a Pitts on the ground so easy that you'll almost lose your taildragger competency. Plus it puts less demand on the brakes until you need to stop or turn around in your parking space. I was sold! I ordered a look-alike replica of the Haigh unit from Aircraft Spruce but the workmanship was unacceptable so I sent it back. The replica was supposed to be about 1/3 the price of the original and used aluminum parts to save weight. I ended up designing my own and incorporating a nifty little feature—a cockpit releasable tail tie down ring. I knew I wasn't going to put a starter on the engine so this feature made sense for hand propping the airplane.



Before I started building anything, I did a stress analysis on the fuselage and determined that it was necessary to add a couple of extra diagonal braces in the fuselage trusswork. Mainly in the cockpit area and behind the seat. Due to the fact that I planned on using a one-piece wing, the lower longeron gets cut at the main spar. Some of the load must be carried through the spar by the attach bolts. So be it! The stress analysis showed the structure to be very robust and capable of reacting whatever forces the wing and tail could impose on it. I ended up with a minimum factor of safety of 1.2 in the lower longeron forward of the main spar box with a +10 load and the airplane CG 3" forward of its max forward CG position. This was the worst case load and should never be the case if the airplane is operated within its weight and balance limits.

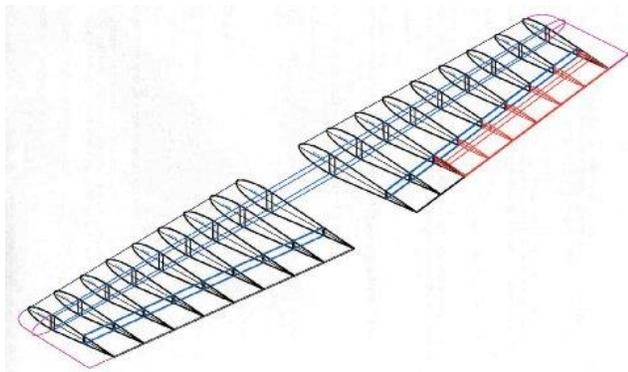


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Lycoming IO-320. The final product was drastically different than the Starlet structurally but dimensionally still very similar.

At Oshkosh 1993, I saw the prototype One-Design before it made its first flight. Immediately noticeable was the fat, really round nosed airfoil on the wing. Jeez, that thing looked tough! When I finally saw it fly less than a year later, I was very impressed with its aerobatic performance. Roll rates in excess of 360° per second! Climb rates better than 2500 ft per minute. And best yet, it looked good to the judges on the ground. WOW! I was absolutely convinced more now than ever before that the O-200 was the engine Excalibur needed. I was already committed to finishing my Excalibur but I was quite envious of the One-Design's performance. The One-Design became the benchmark by which I constantly compare and evaluate Excalibur.

### The Wing Is the Thing!



In May 1994, **Russ Erb** published an article called "*One-Design Airfoil Analysis*" in the EAA Chapter 1000 Newsletter in response to my question of "what makes it tick?" I didn't have the actual airfoil coordinates but, by observation, I reasoned that the airfoil was simply an ellipse with tangent lines drawn to the pre-determined trailing edge location. What Russ found was what I suspected all along: The lift, lift slope, drag, and pitching moment coefficients were not drastically different from a similar looking NACA 0016 airfoil in the normal range of flight angles of attack. However, the stall characteristics were perfect for aerobatics when autorotative maneuvers such as snap rolls and spins are considered. I liked that and since everyone else was using similar "ice-cream-cone" shaped airfoils, so would I.

So here's my current situation. I have a big heavy Continental O-200 on the front end of an airplane designed for a VW engine and even with the tail stretch I mentioned earlier, I'm certain my CG is going to end up too far forward. What to do about the nose heavy condition? Well, the main wing spar location was fixed by the fuselage design and had to remain where it already was. Likewise the seat and firewall locations were already far beyond the point where changing them would be a reasonable thing to do. I had already built the fuselage and I wasn't about to rebuild it. I opted for a more creative solution of moving the wing forward but not changing the spar location. My solution was to simply move the wing ribs forward on the spar. This would effectively move the mean aerodynamic chord of the wing forward to a position

that would be favorable for my CG problem. Of course, that meant I had to re-design the wing...again...and the airfoil would look more conservative than the radical "ice-cream-cone" due to the max thickness point moving aft. It was now 14.5% thick and had a blunt leading edge and a squared off trailing edge. The planform started to evolve into something similar to the One-Design with a little leading edge sweep and the dihedral was removed for aerobatic performance.

I had read and re-read an article I saw on the Stephens Akro wing flutter problems and I had also opted at that point to fully skin the wing with plywood to provide greater torsional stiffness in my wing. There is no longer any fabric covering on any primary structure; it's all plywood. Of course, the plywood skin is also heavier than the fabric covering but at least the weight is almost entirely aft of desired CG position for the airplane which was favorable. Still, I was adding weight to the airplane which I really hated to do.

### Weight Reduction Time...Again!



The heaviest thing about a plywood covered wing is the skin. Unfortunately, even though a wing skin is lightly stressed, the skin must be stiff enough to resist buckling. I needed the plywood skin to carry wing torsional loads so going back to a fabric covered wing was completely out of the question. How about high tech composites? Most people don't realize just how heavy a high tech material such as carbon fiber/epoxy really is; it's roughly three times heavier than birch plywood. So why don't I just make the carbon wing skins 1/3 the thickness of the plywood skins? Well, when you do that, the carbon skins are only 25% as stiff as plywood for buckling resistance. The bottom line is a solid carbon fiber skin, designed to the same buckling criteria as a solid wood skin, will be heavier. So next time someone tells you that they wouldn't consider flying a wooden airplane, you can tell them that wood is, pound for pound, more efficient than carbon fiber when used for wing skins...and it's cheaper!



The wing spar is a totally different animal, however. A wood wing spar is quite heavy when compared to a carbon fiber equivalent. I did the math and there was no way to justify a wood spar in Excalibur. Carbon fiber has material properties (strength and modulus of elasticity) that are an order of magnitude higher than Douglas Fir and even though the density of carbon fiber is 3 times higher, you only need 1/10th the amount of material. Unlike wing skins, a spar doesn't generally have limits placed on it for buckling problems. Its shape takes care of that. The result was I could build a carbon fiber spar that would carry my 750 pound airplane to  $\pm 10$  g's and it would weigh only 19 pounds! That's probably half the weight of the Douglas Fir equivalent! All in all, the lighter but stronger spar made up for some of the weight of the plywood wing skins.

## 90% Done and Only 90% To Go!



I figured I did a pretty good job of keeping the weight out of Excalibur. In its current configuration as shown in the pictures above, it weighs 380 pounds. That includes the engine which weighs nearly 200 pounds alone! I still need to add the wing skins, ailerons, canopy, cowlings, fairings, and paint but I figure there is less than 90 pounds of weight to go before the airplane is complete. That would give me an empty weight of 470 pounds which is outstanding considering the One-Design weighs in at more than 800 pounds empty. Add pilot, parachute and some fuel and I should have a competition weight of 750 pounds. The One-Design is at least 250 pounds heavier. Yeah, it has more power too but all things considered, Excalibur will certainly hold its own against the competition!

## Inverted Fuel System, Inverted Oil System, and Flight Controls...

I have yet to fully design these systems so a detailed description is not possible at this time. In summary, however, I can quickly describe the inverted fuel system as quite simple. It is a flop tube in the main fuel tank feeding an Ellison throttle body injector. The inverted oil system is a lot more complicated and I have only conceptualized it as being a dry-sump system with a remote oil tank. The flight control system is half complete already and includes a fully push-pull tube system in the elevator circuit and most likely a push-pull tube system in the aileron circuit. The rudder is cable operated. There is virtually no similarity to the Corby Starlet in the flight control system.

So now you know. Excalibur definitely has the Corby Starlet in its family tree. The similarities are numerous but at the detail level it's a very different airplane. There are no interchangeable parts with the Starlet design with one exception: The rudder and elevator hinges are 100% pure-bred Corby Starlet! The DNA is an exact match in that particular area!

- Bob Waldmiller

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## Loose Ends

On 2 October your newsletter editor and webmeister **Russ Erb** added a Private Pilot Glider rating to his pilot certificate at Mountain Valley Airport in Tehachapi.

Heard at the Golden West Fly-In: Someone asked what would be required to get a flight in a Thunder Mustang. **Ed Dutreaux** suggested that it would only require checking your Weight & Balance. That is, the *Weight* of your wallet and the *Balance* in your checkbook!

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## Web Site Update

Checking the big web site on 11 October 1999 found the hit counter at **33948** hits, with a jump in the hit rate to about 51/day. I'm guessing the increase was from surfers looking for information on the Edwards Open House.

Other than that, Bearhawk progress continues to interfere with any Web Site work. Aw, shucks.

- **Russ Erb**  
Webmeister

 Just a reminder that the EAA Chapter 1000 Web Site is hosted courtesy of Quantum Networking Solutions, Inc. You can find out more about Qnet at <http://www.qnet.com> or at 661-538-2028.

**Chapter 1000 Calendar**

Nov 3: EAA Chapter 49 Monthly Meeting, 7:30 p.m., Sunnydale School. 1233 S. Ave. J-8, Lancaster, CA. (661) 948-0646

Nov 9: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

**Nov 16: EAA Chapter 1000 Monthly Meeting, 5:00 p.m.**, Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Dec 1: EAA Chapter 49 Monthly Meeting, 7:30 p.m., Sunnydale School. 1233 S. Ave. J-8, Lancaster, CA. (661) 948-0646

Dec 14: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

**Dec 21: EAA Chapter 1000 Monthly Meeting, 5:00 p.m.**, Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Jan 5: EAA Chapter 49 Monthly Meeting, 7:30 p.m., Sunnydale School. 1233 S. Ave. J-8, Lancaster, CA. (661) 948-0646

Jan 11: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

**Jan 18: EAA Chapter 1000 Monthly Meeting, 5:00 p.m.**, Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

Feb 8: EAA Chapter 1000 Board of Directors Meeting, 5:00 p.m., Edwards AFB. Test Pilot School, MOL Room (661) 609-0942

**Feb 15: EAA Chapter 1000 Monthly Meeting, 5:00 p.m.**, Edwards AFB. USAF Test Pilot School, Scobee Auditorium. (661) 609-0942

**For Sale:**

Sonerai IIL project. Fuselage and wings 95% complete. Modified for A65 engine. Engine torn down for overhaul but complete with a great many spare engine parts. Includes instruments. Hydraulic brakes. All excellent work. Call Fletch Burns 760-373-3779

Charlie and Glenna Wagner's house in North Edwards is for sale. If you are interested in the house, please call us at 775-867-4394.

WANTED: "Intake manifold" for a Rotax 582/Ellison throttle body combo. Call Rod Howes 775-867-5513, e-mail to airhowes@yahoo.com

FOR SALE: Ellison throttle body injector, EFS-2. NEW, never used. Cost \$400, Sell \$200. Call Rod Howes 775-867-5513, e-mail to airhowes@yahoo.com

Avid Mk IV project for sale. Fuselage, fast-build wings, landing gear, and fasteners packages. Does not include firewall forward, instrument, and interior packages. Work completed: Tailwheel, flight control linkages, landing gear assembled except for brake plumbing. STOL Wings as received from factory (mostly built). Fuselage on gear, wings on caddy with casters. In storage at Rosamond. Contact John Miltner at perseus@mayanet.com.tr

To join Chapter 1000, send your name, address, EAA number, and \$20 dues to: EAA Chapter 1000, Gary Aldrich, 42370 61<sup>st</sup> St. W, Quartz Hill CA 93536. Membership in National EAA (\$40, 1-800-843-3612) is required.

Contact our officers by e-mail:

President Gary Aldrich: gary\_aldrich@pobox.com

Vice President George Gennuso: pulsar1@qnet.com

Secretary Miles Bowen: mbowen@cybersurfers.net

Technical Counselor Gary Sobek: gasobek@jps.net

Inputs for the newsletter or any comments can be sent to Russ Erb, 661-258-6335, by e-mail to erbman@compuserve.com

From the Project Police legal section: As you probably suspected, contents of The Leading Edge are the viewpoints of the authors. No claim is made and no liability is assumed, expressed or implied as to the technical accuracy or safety of the material presented. The viewpoints expressed are not necessarily those of Chapter 1000 or the Experimental Aircraft Association. Project Police reports are printed as they are received, with no attempt made to determine if they contain the minimum daily allowance of truth. So there!

**THE LEADING EDGE****MUROC EAA CHAPTER 1000 NEWSLETTER****C/O Russ Erb****6708 Doolittle Dr****Edwards CA 93523-2106****<http://www.eaa1000.av.org>****ADDRESS CORRECTION REQUESTED****THIS MONTH'S HIGHLIGHTS:****NO OCTOBER MEETING****WALDO'S EXCALIBUR STORY****GOLDEN WEST FLY-IN REPORT**