



# DESIGNEE NEWSLETTER

THE PUBLICATION OF THE EAA DESIGNEE PROGRAM



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The *DESIGNEE NEWSLETTER* is a forum for the exchange of information and ideas of interest to aircraft and ultralight builders, restorers, and flyers. The sources of the materials published are EAA Designees, readers, Chapter newsletters, and other publications. Readers are encouraged to submit manuscripts, drawings, and black/white photos for consideration. Every effort is made to select accurate materials of interest to a majority of readers. Opinions expressed and responsibility for accuracy rests entirely with the contributor. All materials submitted become the property of EAA - no remuneration will be made. Materials should be sent to Chuck Larsen, EAA Designee Director.

## AUTHORIZED OPERATIONS FOR AIRCRAFT ISSUED AN EXPERIMENTAL CERTIFICATE FOR OPERATING AMATEUR-BUILT AIRCRAFT

From an F.A.A. memo

**Agricultural Application** An amateur-built aircraft issued an experimental certificate may be operated for agricultural purposes provided that:

1. All of the requirements applicable to amateur-built aircraft have been complied with (reference FAR 91.42, Order 8130.2B, Airworthiness Certification of Aircraft and Related Approvals);
2. The applicable operating time in an assigned flight test area is satisfied with the dispensing equipment installed on the aircraft;
3. The following operating limitation is prescribed (reference FAR 91.42 (e)): The operator of this aircraft must be certificated under FAR 137 prior to any agricultural aircraft operations.

Under this policy, an amateur-builder may conduct agricultural aircraft operations over his own land or crops as provided in Section 137.19 of the FAR. No commercial or for hire (compensation) operations are permitted. The operator of the aircraft must apply and complete all certification requirements for a private agricultural aircraft operator certificate prior to such operations.

**Flight Training** An aircraft with an experimental certificate, amateur-built, may be used for crew training or flight instruction where no charges or remuneration for the use of the aircraft are involved. A pilot or owner may avail themselves of the services of an instructor to take dual instruction in an experimental aircraft, however, a commercial operator may not provide such an aircraft for the purpose of giving flight instruction for hire.

## TECHNOTES FROM FIBERGLASS FREDDY:



From the EAA Chapter 319 Newsletter

When laying fiberglass cloth around a corner, sand a radius of at least 1/8" on the corner. If you don't, the fiberglass will not lay down and you will have an air pocket at the corner. This is a weak spot in the layup and must be avoided!



## AN EPOXY CAUTION

The following is an abstract of a report published in NASA TECH BRIEFS, Vol. 6, No. 3.

"The corrosive alkaline surface layer of an epoxy resin product formed by the curing of the epoxy with an aliphatic amine is eliminated by first applying a non-solvent to remove most or all of the free unreacted amine and then applying a layer of a chemical reagent to neutralize the unused amine or amine functional groups by forming a substituted urea. The surface then may be rinsed with acetone and then with alcohol."

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## DESIGNEES AND SUBSCRIBERS:

Preparations for OSHKOSH '84 are in "high gear". You can be a part of the volunteer effort that has been so important to EAA's continued success by helping with the convention site preparation. Contact Vern Lichtenberg, EAA Site Supervisor at Oshkosh, (414) 426-4800. From now through the week after the convention EAAers will be working seven days a week to prepare, present and clean up after the convention. If you live within commuting distance consider joining us for a "workparty weekend". If you arrive at the convention early go to the Maintenance Office on the farmstead in the campground to get your project to help with the last minute preparations for the convention. From the Friday before the convention through convention week all volunteer efforts are coordinated through the Volunteer Center located just north of the north exhibit building in the main convention area. We look forward to your participating as an EAA volunteer this year.

Your special skills are needed during the convention to assist in workshop programs, the technical information center and other Designee activities. Please contact me at Headquarters before the convention and at the Chapter Volunteer Center during OSHKOSH '84 to volunteer your time and talents.

Volunteers are special people to EAA. Volunteers have repeatedly expressed that they receive far more; in friendships, camaraderie and the feeling of accomplishment; than they give. We invite you to become a part of the "inside" of EAA as a volunteer worker.

EAA AIR ACADEMY '84, a summer experience for young people 15 to 17, still needs a "few good people" to help in their workshop activities. Consider joining us for the entire three week program or two or three days so that you can have the opportunity to pass on your aviation knowledge and experience to the next generation. Please contact Chuck Larsen, Education Director, at the EAA Aviation Center for details.

Chuck Larsen, Designee Director



WITTMAN AIRFIELD  
JULY 28-AUG. 4

# TECHNICAL TOPICS TEST FLYING YOUR NEW HOMEBUILT AIRPLANE

The final segment of a two-part article from *THE STARDUSTER MAGAZINE* published by Stolp Starduster, Corp. 4301 Twining, Riverside, CA 92509. It is available by subscription for \$8.00 per year.

Testing a new airplane can be a pleasant and rewarding experience, or it can be one of actual terror. It is up to you, the builder and pilot, which way it will turn out.

Naturally, you want to enjoy your first, and subsequent flights. Advance preparation can make them pleasant memories. Start with the knowledge that the construction and design requirements called for in the plans have been met. A review along these lines can be beneficial.

You should be knowledgeable concerning the following:

1. Weight and balance figures.
2. Recommended C.G. and C.G. envelope limits.
3. Any modifications. Their effect on flight characteristics.

4. Any difference in engines. Effect on C.G. and performance.
5. Anything added after weight and balance, such as engine accessories, radios, etc. Their effect on weight and balance.
6. Any modifications that might affect ground handling.

Even when changes are recommended by the designer, I feel it is a good idea to find out, if possible, the reason for such changes. It helps you understand your project that much better.

A nose heavy airplane may not be spinnable. A tail heavy airplane may not be recoverable from spinning. While some mods may have little or no effect, others can drastically affect flight characteristics, or ground handling.

Many designers use different weight and balance datum. Some base their figures on distance from the firewall. Others use wheels, or wing leading edges. Some give a definite C.G. range, in inches. Others use a percentage of wing chord. So get on the same wave length as your designer. Know what he is talking about.

## TEST RECORD

Aircraft Type _____ N. Number _____		Stalls
Cockpit check — Blind folded _____		1st indication of loss of lift (Stall Break) _____
Take-Off		Gross Wt. _____
Gross Wt. _____	T.O. Ground Roll _____	Power off, Straight MPH _____ Alt. Loss _____
Outside Air Temp. _____	To Clear 50 ft. OBJ. _____	Power off 30° Bank MPH _____ Alt. Loss _____
Runway Elevation _____		Full Throttle, Straight MPH _____ Alt. Loss _____
Density Altitude _____		Full Throttle 30° Bank MPH _____ Alt. Loss _____
Wind _____		
Full Throttle Static _____		Spins
Climb		One Turn Altitude Loss _____
Best Angle (1.2 VSO) _____		Two Turn Altitude Loss _____
Best Rate (1.6 VSO) _____		Three Turn Altitude Loss _____
MSL to 1000 ft. RPM		Immediate Recovery after
Time		entry Altitude Loss _____
R/C		
OAT		Glide — Power Off
OIL P.		Gross Wt. _____
OIL T.		Glide 180° Turn Alt. Loss _____
CHT		Glide 360° Turn Alt. Loss _____
1000 ft. — 2000 ft.		MIN Rate of Descent _____
Climb		Indicated A/S _____
2000 ft. — 3000 ft. to whatever altitude desired		
next		Landing
Cruise		Gross Wt. _____ Cross Wind Component _____
Normal	Best Range	OAT _____ Normal Ldg Roll _____ ft.
	Best Endurance	Runway Elevation _____ Short Field Ldg Roll _____
Sea Level:	OAT _____	Density Alt. _____ Max Braking _____ ft.
IAS	IAS _____	Wind _____
TAS	TAS _____	
OIL T.	OIL T. _____	
OIL P.	OIL P. _____	
C.H.T.	C.H.T. _____	
Fuel Cons.	Fuel Cons. _____	
Oil Cons.	Oil Cons. _____	
1000 ft.		
2000 ft.		
etc.		
(if more than one tank)		
Actual usable fuel (Eng. Starvation) _____		

A good inspection program is essential, and is in the EAA builders manual. We are reprinting the 100 hour inspection check list from CAM 18. You can adapt this to your needs. Pay particular attention to safetying of nuts and flying wires with cotter keys. Also check to see that fork ends of flying wires are in past the "weep" hole. Stick a small wire in the weep hole, to check if the wire is in far enough.

As pointed out in my last article, I am strongly opposed to so called, by me, low and slow first flights. Such testing has been recommended by well meaning people, who, I feel, are inexperienced in the test pilot field.

High speed taxiing should be done well below lift off speed. It is accomplished, not to check flight controls, but to test tail wheel steering, tracking, and brake effectiveness. At the completion of taxi tests, check brakes and lines for leaks.

After all preliminary testing and checking has been accomplished, you are ready for your first takeoff, and can proceed with confidence. Give it the gun, and go. Make a normal takeoff and departure, using a fairly flat climb angle. Take it to altitude, and initiate a series of flight test maneuvers. Check to see that you can hold the wings level in a three point attitude. After stall speed is determined, about 1.6 VSO will give you your max rate of climb. About 1.4 VSO will give you a good glide speed.

During your first flight, monitoring of engine instruments is essential. Unusual readings are a warning to abort the flight and make an immediate safe landing. You may save an engine this way. As a matter of fact, in flight scanning of instruments is a good habit to get into. And I do not mean staring.

On your first flight, be on the alert for problems. Overheating means you may need additional cooling air, tighter baffling, or a relocated oil cooler. On the larger engines, you may need an additional oil cooler. Your first flight should stay within gliding distance of the airport. On takeoff, if the runway is short, make a 45 degree turn to the left, then 45 degrees to the right, climbing over the runway until sufficient altitude is reached.

Start the test program by rolling from bank to bank. This will quickly give you the feel of the controls, and the relationship between rudder and aileron. Start with 180 degree turns, right and left, and work up to 360 degree turns. At this point, increase the bank and back pressure until you get a stall. Check to see how violent the stall, and how quickly it flies again when back pressure is released.

Any time you receive unusual control response, break off testing until a valid reason is obtained, and corrective measures taken. If necessary, modify, and/or obtain help from a more experienced pilot.

My reason for first doing stalls in a bank (high speed induced stalls) is that as soon as back pressure is released, the airplane is flying again. If these stalls are normal, stall without power, and simulated landing stalls can be undertaken.

After you have become acquainted with your airplane, done stalls from all attitudes and power settings, come in for a landing. At this point you should know your airplane well enough so that you don't need your airspeed. It is relatively unimportant.

Your first flight should not be over 30 minutes. There are many things to check before the next flight is made. After a thorough check of the engine compartment, controls, flight surfaces, and fuselage, proceed with your test flying. All temperatures and pressures should be stabilized and normal. Do not be satisfied that they are within limits.

Now, you are ready to obtain performance figures. Before your first flight, the FAA requires that instruments be marked and red lined. In the case of the airspeed indicator, this can only be done after the first flight. The stall speed is the first red line. The green arc goes up to where the yellow arc starts. The intersection of green and yellow arc marks your max. maneuver speed. For 6.G. limit loading, this would be 2.45 times stall speed. In the yellow speed, full control deflection is no longer allowed. The yellow arc continues to the red line, which marks your never exceed speed. Red line speed, VNE, is 10% below tested dive speed.

Save take-off and landing roll distance, and distance to clear 50' obstacle until last. The better you know your airplane, the more accurate and consistent will be your figures.

An abbreviated test form follows, to help you establish performance figures for your airplane. It can become part of your operations manual. Such a manual will be helpful if you decide to sell your bird. And after such a test program, I guarantee you will be a better pilot.

## DESIGNEE VISITS

*One of the important services provided by our DESIGNEES is visiting aircraft building/restoration projects to discuss and offer suggestions about them. The DESIGNEES in the following listing are to be commended for their efforts in helping to make sport aviation a safer activity by providing this service. Comments for publication are selected for the purpose of providing guidance or assistance to builders and the DESIGNEES visiting them. DESIGNEES are requested to note problems or procedures observed in their project visits in the comment's section of the Designee Visit Report.*

Francis McRae #410  
Modesto, California  
(209) 529-3894  
\*Long Eze

Tex W. Harding #461  
Sequim, Washington  
(206) 683-3168  
\*Acro Sport  
\*Glasair - SH

Gideon Jr. Hagood #516  
Newport News, Virginia  
(804) 596-2672  
\*Dragon Fly

Ken Heidger #693  
Roseville, California  
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F. 8L Falco  
\*RV-3  
\*Thorp T-18

Alfred P. Coha #777  
San Diego, California  
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\*Solitare  
\*Long Eze

Joe G. Roller #977  
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Sun Lakes, Arizona  
(602) 895-6314  
\*Bakeng Duce

H. Owen #1037  
Escanaba, Michigan  
(906) 786-7523  
\*Sidewinder

Zane Casey #1043  
Pasco, Washington  
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\*GN-1 Air Camper

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(913) 647-5625  
\*Bakeng "Duce"

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Fort Walton Beach, Florida  
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\*Evans VP-2

Charles Burich #1093  
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(315) 695-4365  
\*Osprey 2

Red Beitelshees #1106  
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\*KR-2

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Brooklin, Ontario, Canada  
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\*Lazair/Single place

William Y. Miller #1131  
Meza, Arizona  
(602) 833-4715  
\*Falco Series 4

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Hales Corners, Wisconsin  
(414) 425-0998  
\*Acro Sport II

Robert Harvey #1163  
Granville, Ohio  
(614) 587-1681  
\*RV-4  
\*Steen Skybolt

Vernon C. Long #1177  
Eldridge, Iowa  
(319) 285-4549  
\*Rutan Long-EZ

Ales Strojnik #1180  
Tempe, Arizona  
(602) 838-1832  
\*Powered Sailplane  
\*Monnett MONI

Lewis A. Jackson #1181  
Xenia, Ohio  
(513) 372-3318  
\*Sequoia Falco

Kearney V. Lundy #1198  
Long Beach, Mississippi  
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\*RV-3  
\*Mitchell B-10  
Meadow Lark

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\*Long EZ

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Vallejo, California  
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\*Bakeng Duce  
\*Polliwgen

Jimi Madewell #1229  
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\*Wichawk

# LETTERS 'N SHOP TALK



## THE ULTIMATE COST FACTOR

By Bill Reeder, FAA 102673, from Chapter 85's Newsletter via Chapter 364

Who the devil was Mr. AN and why the devil am I required to use his hardware?

I could use this newfangled floor wax on my airplane — the manufacturer claims it will put a shine on a tennis ball even after Fido has chewed on it!

Gee whizz I'm gonna use this new light weight electrical wire in my project. I'll save enough weight to add a digital pilot degauser.

Well I hope I have your attention now. These statements above have been dressed up with a little "used oaks" to help you see the point more graphically. Well meaning and good intentioned people have presented these ideas to me in the short time I have been a Designer. I hope through this article I can help you to be at least skeptical enough to see the other side of the situation.

Let me explain about AN hardware as it applies to aircraft. AN bolts are designed to meet standards for all dimensions as well as strength and corrosion resistance. It is possible to substitute a grade B bolt for AN but at the expense of corrosion resistance and it may not be possible to fit the shank without having thread inside the fitting.

Floor waxes and in particular new industrial floor waxes, contain potent solvents for removing previous waxes and perhaps would remove dope or fabric cement. While on this subject we could consider silicone and how difficult repairs are after silicone treatment.

Wire, this is a really bad one. Plastic wire has no place inside an airplane. Melting plastic, toxic fumes, fire, smoke — need I say more, AN cable is approved and as safe as possible. Use of non-approved cable in a certificated aircraft is not legal.

How can we be aware of all the materials and techniques we are employing in our projects? I don't suppose that anyone can solve this one, but your chances of total success are better if you stay close to accepted aircraft standards and materials. Departures from standards can be approached with the same formula used by professional design and testing programs.

You may feel this would take the Experimental out of our Aircraft Association. I say nothing will stop us faster than a trail

of fatal accidents pointing to less than careful experimenters. Always keep in mind a bright idea may have a dark side and a cheaper alternative may have an unthinkable ultimate cost.

## FUEL SYSTEM PROBLEMS

From Dick Smith, Designee 1613, Chapter 79, Spokane, Washington

Recently I have assisted in solving several problems concerning local members, which will be of interest to Glasair (and other) builders.

One of our Chapter members recently had his Glasair signed off and moved here for flight tests. The problem which had persisted for several weeks and caused a delay in flying off the required time was a fluctuating and eventual loss of fuel pressure and a rough running engine. The problem was recurring and most prevalent during runup with the cowling installed. Continued operation would lead to engine stoppage which if the fuel boost pump was turned on was also immediate.

Inspection of the system found several deficiencies (loose primer, faulty header tank pickup) which were corrected. Subsequent testing with portions of the fuel system bypassed eliminated the problem. Further testing utilizing a temperature probe revealed that although the temperature in the rear of the engine compartment was 70-140 degrees F the temperature at the gascolator (installed bottom center of the firewall) was sufficient to boil/vaporize the fuel.

Solution: move the gascolator to the side away from the engine cooling air exit and fly!

This information has been reported to the designer. However several Glasair builders have indicated to me that various problems and the solutions to them have not been passed on to other builders by the designer.

I have also inspected several other designs including the Quickie. I suggest that builders pay close attention to hardware installation on rotating controls. A cotter key, castellated nut and drilled bolt should be used. Especially up behind the cockpit where flight control bellcranks and actuators are difficult to inspect for security. Fiber and steel lock nuts have been known to backoff the bolt!

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