



# 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.

## Designees & Subscribers,

This newsletter is published in support of the EAA Designee Program, aircraft builders and restorers. It is a forum to exchange safety and technical information as well as building and restoration tips. This publication, as well as Designees themselves, should reflect all phases of EAA activities — Homebuilts, Aerobatic aircraft, Antique/Classics, Ultralights and all other aircraft used for recreational flying.

Contributions of materials for publication in the *DESIGNEE NEWSLETTER* are requested from Designees, subscribers and readers. Most topics relating to aircraft, tools, shop tips and safety are appropriate and will be considered. Please send materials to my attention at EAA Headquarters.

Chuck Larsen, Designee Director

## CHAPTER DESIGNEE PROGRAM

by Don Prestin, EAA 105084, Designee 1162

From the Santa Rosa, California EAA Chapter 124 Newsletter

The Designee is an important member of all Chapters. He should be an experienced individual in the construction methods and maintenance procedures of the various types of chapter aircraft, whether they be tube and fabric, wood, metal, or composite type materials. Since he is not licensed, his is an advisory position only. He does not sign off work as the A & P does — that is done by the builder and the FAA Representative. Each visit to your project is to help you, the builder, with questions, problems, and normal aircraft construction procedures. By working with the Designee, you should be able to have the FAA Representative come out at the recommended times and sign off your project with few or no delays.

An additional task of the Designee is to help transmit known problems or discovered ones, to the builders and designers of certain type aircraft (e.g. Vari-Eze, Quikie, Mustang II, Marquardt Charger, Starduster, etc.) Reports on each visit are sent to National with a status report or problems. These reports are similar to an FAA Airworthiness Directive. National then sends this information out by means of their monthly Designee Newsletter. Your Chapter Designee then tries to pass the information on to you — **the builder** by this newsletter, or however possible.

There are many other Chapter men who are experienced with the various aircraft. If you need any help with a problem or have questions, feel free to call or ask them for assistance. We all want to help you build a **safe** and **complete** aircraft project.

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OSHKOSH '83  
WITTMAN FIELD, OSHKOSH, WI  
JULY 30 - AUGUST 6, 1983



## WE NEED YOU AT OSHKOSH '83

Our annual celebration of flight at Oshkosh, Wisconsin is a key component in the EAA Designee Program. It is an opportunity to participate in forums, observe construction workshops and exchange information with fellow Designees and builders. We particularly need your participation in the following areas of Designee activity at this year's Convention.

### HELP! HELP! HELP!

John Grega needs a few good men to help review air show airplanes — especially during the first days of the Convention. If you plan to attend and can support him in this important activity, please contact:

John Grega  
355 Grand Blvd.  
Bedford, OH 44014  
Telephone: (216) 232-5790

The Designee forums, organized by Fred Goldstone, will consist of initial presentation in the Chapter Forums Tent and a "hands on" presentation of the review of an aircraft to provide information to Designees about things to look for and techniques of construction so they might better serve builders and restorers near their home. If you will be attending and would like to help, contact him at the address below.

Mr. Fred Goldstone  
Route 3  
Grafton, NH 58237  
Telephone: (701) 352-2508

Fred also provides the leadership for the Designee Information Section of the Technical Information Center. You are needed to help in this area to help Fred answer questions about the Designee Program and aircraft construction or restoration. Contact Fred with your commitment to help the man in the Designee Information Section.

# LETTERS 'N SHOP TALK



**REFERENCE GUIDES TO EAA PUBLICATIONS** — The 1982 REFERENCE GUIDE TO SPORT AVIATION, The VINTAGE AIRPLANE, SPORT AEROBATICS and ULTRALIGHT magazines is now available. With the guide you can find all articles in EAA publications on a particular topic or aircraft. This accurate, extensive index to EAA publications is a vital addition to any personal or Chapter's magazine collection.

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Mt. Pleasant, MI 48858

## PIN POINTING OIL LEAKS

*From New York City, New York Chapter 230' Newsletter*

Pin pointing oil leaks can be especially frustrating particularly on air cooled engines where the air flow spreads the mess generously over hill and dale. Baby talcum and a hand operated garden duster will help speed up the process of spotting the source. Clean the engine down thoroughly with a mixture of Gunk and kerosene and a high pressure hose. Let dry. The kerosene will leave a slight oil film on the surface of the engine. Now generously dust the engine with the talcum until everything is covered with white powder. Start the engine and watch carefully under good lighting. In a few minutes, you'll spot the tell-tale darkening spot where the leak originates. Sometimes the leak takes time to develop. It may only occur when the oil is thinned out by extended operation. There are dye additives which will color the oil and although I've never heard of anyone doing it, I have this idea that an ultra-violet dye and a black light source would be equally effective although a lot more expensive.

## A CAUTIONARY NOTE REGARDING INDUCTION ICING

*From the Eugene, Oregon Chapter 31 Newsletter WINGS and THINGS*

Summer is here and you'd think the flyin' would be easy, but unbelievable as it may seem, pilots still have to be on the alert for carb icing. Even when the ground air is close to 90 degrees, it's possible for the temperature in the carburetor to fall below freezing. The following is an excerpt from Aviation Insurance News, Volume 12, Number 3, June 1982:

"The (National Transportation) Safety Board tested two typical light planes, one with a float-type carburetor and the other with a pressure-type. With the first plane, serious icing took place with air temperature up to about 70 degrees Fahrenheit and humidity over 32%, at glide power. At cruise the maximum temperature for icing was 55 degrees Fahrenheit, with the humidity 90% to 100%. When you consider that at cruise the ambient temperature is much lower than the surface temperature, you have to realize that induction icing is possible at almost any time and place."

For more information, you can check the FAA's Advisory Circular on induction icing (AC 20-113, October 22, 1981). A review of the precautions necessary to prevent icing could save your life.

## CHOOSING THE RIGHT AIRPLANE TO BUILD

*By Bob Gardner, Designer 1120 of Oshawa, Ontario, Canada*

This article is intended to help you decide which homebuilt design would be best for YOU in terms of cost, ease of construction and flying enjoyment.

First of all, how much money are you willing to spend? A homebuilt design can cost as little as \$5000 to build, or its cost can be MANY, MANY times that depending on design complexity, materials required, engine type and horsepower, etc. . . . The prospective builder should have some idea of the amount of money he is willing to spend on his project. In all probability, the actual cost will exceed the estimate (Murphy's Law will see to that), but at least, the original estimate will give you a "ball park" figure to work with.

Secondly, what kind of flying do you intend to do with your new bird? If all you want is to fly around the patch on Sunday afternoons, your choice should be more or less limited to one of the smaller, simpler planes.

If, on the other hand, you are aerobically inclined, you will have to look into much higher powered, more sophisticated designs to satisfy your needs.

If you want your finished product to haul four people plus baggage cross-country at a fair clip, you will be looking for a high performance — and high priced — design to fill the bill.

No airplane will satisfy all of a pilot's probable needs. You should look at your USUAL flying requirements to decide which type of homebuilt aircraft will best meet those requirements. If every weekend you fly alone, doing airwork and touch and goes, and every Christmas you fly the wife and kids to Grandma's, it should be obvious what type of airplane would fulfill the majority of YOUR USUAL flying requirements.

You should also consider your experience level when choosing a design. There are many homebuilts that would be quite a handful for the low-time pilot. DON'T build an airplane which you will be unable to fly safely.

Last, but certainly not least, what are the materials and construction techniques required to build your dream machine? Today's homebuilt designs encompass every conceivable construction method from tried-and-true wood and dope and fabric to the most modern space-age techniques.

If you are good at woodworking or sheet-metal work, a design featuring those skills would probably be the easiest and most satisfying for you to build.

If you have no prior experience in any construction technique choose the method which appeals to you the most, since no matter what you choose, you will be learning a new skill. None of the techniques used in aircraft construction are terribly difficult, requiring only patience and application to master. Naturally, the more manual dexterity you have, the easier it will be for you.

Only a small percentage of the homebuilt projects which are begun are actually completed and flown. The rest are either abandoned and sit gathering dust in a garage, or they are sold by the disenchanted builder and are completed and flown by someone else.

If you wish to be among those who have experienced the thrill of the first flight in an aircraft which was fashioned with your own two hands, give very careful consideration to the points outlined above. Choose the design which will best fit into your flying lifestyle; one which will give you the most enjoyment to build and fly.

# TECHNICAL TOPICS

## WING SUPPORT CAGE

By William L. Madden, EAA 8827, Designee 1099

**GIVEN:** One 37 foot one-piece cantilever wing in need of recovering.

**SITUATION:** You live and work alone, your friends live too far away to be "on call" at all hours and your neighbors look like they belonged in a police lineup.

**PROBLEM:** Your mission, if you decide to accept it, is to recover this wing and return it to service. If you are captured the Secretary will disavow . . . (sorry, wrong script.)

**SOLUTION:** Such was the situation I faced when the fabric on my Fournier RP-4D Motorglider would no longer pass inspection. What follows may be of interest to someone facing a similar problem. If nothing else, it shows to what lengths some of us will go to be independent.

A careful look at the photos should reveal the basic idea. I wanted to be able to flip the wing over by myself and not have it rest on sawhorses or anything else that might mar a newly sprayed surface. Since the cantilever wing offered no strong attach points near the tips, the logical thing was to suspend it from the same fittings that support it in the fuselage. No dimensions are given here since this rig will have to be tailored to each specific application. The purpose here is to present one way of attacking the problem and not to offer plans.

The entire cage was welded up out of  $\frac{3}{4}$  inch electrical conduit. **WARNING! DO NOT BREATHE THE FUMES!** I always take the pieces to be welded outdoors and, while standing upwind, burn off the zinc coating well back from the area to be welded. Once this is done, the conduit will weld almost as easily as chrome-moly.

The two hoops, which are the heart of the rig, did not require any special tools other than a standard conduit bender available in most hardware stores. I suspect that some wooden blocks clamped to a work bench would also work. Each hoop required most of two 10 foot lengths of conduit. A little quick geometry will show that the maximum hoop diameter attainable from 20 feet of conduit is 76 inches. ( $C = D$ ) My wing chord was 55 inches at the root and I chose a hoop diameter of 62 inches. This size put the wing at a comfortable working height when level.

To make the hoop halves, choose the radius of the circle you want and, using a string and piece of chalk, draw a semi-circle of that radius on the floor of the shop. Start at one end of a 10 foot length of conduit and, using the bender, apply pressure to the handle until you think you MIGHT have felt it move. Slip the bender along the conduit six or eight inches and repeat. After a few repetitions check it

against the chalk mark on the floor and adjust your technique accordingly. Use care to keep the bend in one plane so you don't end up with the start of a corkscrew. I found I could correct small variations from the desired radius with a rubber mallet and a couple of 2 by 4's or with hand pressure alone.

Once you have four "half-hoops" trim off the excess and pair them up to obtain the best matching set of hoops you can get. I used short pieces of angle iron welded to the ends of the half-hoops and bolted together to make the joints shown in the photos.

From here on you're pretty much on your own as the hoops must be adapted to your particular situation. If you decide to build something like this, here are a few additional pointers.

- Build the complete wing support truss into either the top or bottom set of half-hoops so that the remaining set can be attached or removed as a unit without destroying the structural integrity of the wing/hoop assembly.
- Use lots of triangles in the trusses for rigidity. This is a cut-and-fit job involving a lot of tack welding in place. I used several wet rags on the wood wing to protect it and had a fire extinguisher handy. Final welding was done with the cage removed from the wing.
- Weld the cross braces to the inside of the hoops to prevent interference with the cradle wheels.
- If you use rubber dolly wheels for the cradle as I did, cut large grooves in the rims for the hoops to ride in. Be sure to mount them in extra wide brackets so they are free to slide along their axels. I did not do this at first and the cage would derail due to small variations in the spacing of the hoops. If I were doing it over I would consider supporting the cage on a pair of oversized rolling pins turned on a wood lathe.
- It would have been nice if the wing could have been located so that its CG coincided with the axis of rotation of the cage. This was not possible, in my case, without restoring to very large hoops. As the photos show, I use a piece of 2 by 4 as a prop to keep the rig from turning leading edge down.

"So", you ask, "you went to all this trouble to cover one wing. What good is this thing now?" Well, there's this Great Lakes fuselage that's going to need cover some day. With the cage clamped to the firewall and the tailpost properly supported I'll be able to roll it around its longitudinal axis during that project. And then there is this very large pet squirrel . . .



Figure 1. General view of wing support cage. Note 2 by 4 used to prop wing in desired position.



Figure 2. View of hoop splice and forward wing attach point. Cradle frame is made of 2 by 4's bolted together.

# DESIGNEE VISITS

One of the important services provided by our DESIGNEEES is visiting aircraft building/restoration projects to discuss and offer suggestions about them. The DESIGNEEES 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 DESIGNEEES visiting them. DESIGNEEES are requested to note problems or procedures observed in their project visits in the comment's section of the Designee Visit Report.

Clair O. Meyer, #46  
Clarion, Iowa  
(515) 532-2602  
\*Mitchell Wing  
\*PF-101  
\*Piel Emeraude  
\*BD-4  
\*Pietenpol

R. Walker, #61  
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\*BD-5  
\*BD-5

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\*Quickie 2  
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\*Moni

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\*Miniplane

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\*LongEZ

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\*Sonerai II  
\*RV-4  
\*Vari-Viggen  
\*KR-2  
\*VariEze  
\*Taylorcraft

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\*Moni

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