



# 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.

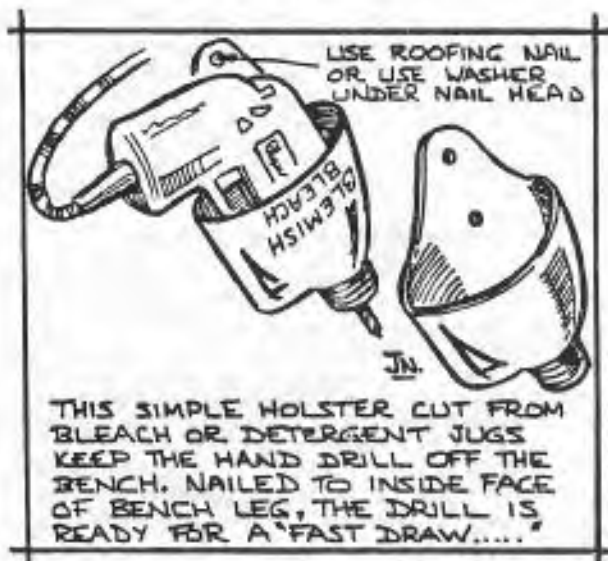
## HOW TO BOIL A FROG

From *THE RUNWAY*, Statesboro, Georgia  
EAA Chapter 459's Newsletter

For those who want to boil a frog, there are three methods. Two of these won't work. If the process is started with very hot or very cold water, the frog will just jump out. You must start the frog cooking in water that is room temperature. Then the temperature should rise till it's boiling. The frog, acclimating to the change, will cook before he panics. **Moral!** Pilots, like frogs, seldom notice change if it creeps up on them unnoticed. They acclimatize flying in lower and lower visibility conditions, not using checklists, not maintaining proficiency and flying lower and slower. They take short cuts and may find they are "boiled" by a serious mishap.

## NICE TO KNOW

By Jim Newmann



THIS SIMPLE HOLSTER CUT FROM BLEACH OR DETERGENT JUGS KEEP THE HAND DRILL OFF THE BENCH. NAILED TO INSIDE FACE OF BENCH LEG, THE DRILL IS READY FOR A "FAST DRAW...."

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## 1984 DESIGNEE REVALIDATION MATERIALS ENCLOSED.

(Revalidation does not apply to subscribers.)

### Designees and Subscribers,

October brings us not only the changing of the seasons, but also the time of the year when all EAA Designees must complete a revalidation reaffirming their interest and commitment to this vital program. Those Designees not revalidated on the form in this month's *DESIGNEE NEWSLETTER* or on their Chapter's 1984 Status Report by January 1, 1984 will be considered inactive and no longer receive the *DESIGNEE NEWSLETTER* or associated materials.

Please take the time necessary to complete each blank on the Designee Revalidation form including the review of Designee activities for 1983. This information will not only help us to know you better but will provide valuable input for the review and ongoing changes in the Designee program and *DESIGNEE NEWSLETTER*. Comments and recommendations for both the Designee program and *DESIGNEE NEWSLETTER* will be sincerely appreciated. Please attach your comments to the form if the space provided is not sufficient.

We look with great anticipation to the coming year. Your participation, as an EAA Designee, can provide a significant contribution to our ongoing sport aviation activities. Designees have been recognized by FAA and thousands of successful experimental aircraft builders as an essential ingredient for the safe completion and testing of these aircraft. As an EAA Designee offering advice or providing guidance in the selection, construction or restoration of fellow EAAers projects, you are to be applauded for your involvement and accomplishments. We look forward to your revalidating for the coming year.

Chuck Larsen, Designee Director

# LETTERS 'N SHOP TALK



## CHANGES TO FAR PARTS 43 & 91

*From the Chapter 64 Newsletter "Flying Wire"*

There have been several changes to Federal Aviation Regulations (FAR) numbers 43 and 91 that may effect you. Here are some of the revisions.

1. The terms "rebuilt" or "overhauled" cannot be used in describing maintenance work performed unless certain FAA approved standards have been complied with.
2. Non-certified persons working under the supervision of a mechanic or repairman cannot perform any inspection function required by FAR 91 or 125 (100 Hour and Annual Inspections).
3. Pilots performing preventative maintenance are required to make maintenance record entries showing their certificate type and number to approve the aircraft for return to service. Student pilots do not have this privilege.
4. Component parts of aircraft now fall under the maintenance rules of FAR 43. Heretofore, parts did not require approval of maintenance until they became part of a whole aircraft being returned to service.
5. Static system leak checks are now required to be repeated each time the system is disturbed (opened and closed). These inspections have been transferred to a new FAR section 91.171. This new section also requires altitude reporting altimeter/transponder installations to be tested together as a system and the test must be repeated upon initial installation and each time maintenance is performed on the system.
6. It is now a criminal offense to make intentionally false statements in maintenance records. The penalties could consist of a \$10,000 fine, a five-year prison term, or both.

## LIGHTWEIGHT ALTERNATOR

Chuck,

This is some information that I had been looking to find for several years. I needed a lightweight alternator, belt driven 12 volt, 10 amp. I found it on a Cougar last month. It is sold by a Japanese tractor company and used on a Kubota Diesel tractor model B8200. Part no. Alt. 15531-6401-0, priced at \$57.00. Part no. Reg. 15533-64600, priced at \$26.10.

It is small and weighs less than 5 lbs. I hope the information will help someone.

Lee Stevens, Designee 360  
1112 South 31st Avenue  
Yakima, WA 98902



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## RUDDER BALANCE

*From Henry Kleczka, EAA 77120  
Franklin, Wisconsin*

Henry brought this interesting answer to how to fabricate a BD-5 rudder balance into Headquarters recently. This same concept could be applied to the balancing of control surfaces on many aircraft types.

Henry formed a foam male mold around which to cast a Plaster of Paris female mold for the streamlined fiberglass cover. This fairing was molded in two pieces, glued together and smoothed. This was mounted to a flat plate with a channel-iron angle bolted to it which provides the mount for the lead counterbalance. The photo well illustrates his idea.

— Editor



## "POP" RIVET REMINDER

*From Dick Kurzenberger, EAA 92200, D/N 937*

This is a reminder for those using "pop" rivets, even though much has been written about "pop" rivets, somehow the hardware store variety makes its way into some of our airplanes. This is a NO-NO. Before using rivets, always make sure that they are "STRUCTURAL" type like the Cherry Q, as one example.

## SYNTHETIC AVIATION OIL APPROVED

A new 100% synthetic lubricant for reciprocating aircraft engines recently received Federal Aviation Administration approval, STC SE128NE for AVCO-Lycoming engines. The oil is a 15W-50 100% synthetic engine oil named "AVOIL". It is manufactured by AMS/OIL Inc. of Superior, WI, a developer and manufacturer of synthetic lubricants for piston-type engines.

AVOIL has been shown to meet the AVCO-Lycoming Specification 301-F for engine lubricants, as well as MIL-L-22851C and MIL-L-21260C (rust protection and acid neutralization) specifications. Teledyne-Continental is currently completing tests to verify AVOIL's performance in accordance with their specifications.

# TECHNICAL TOPICS

## YOU TOO CAN BE A "KOPY KAT"

*From the Dalworth, Texas Chapter 34 Newsletter  
by Richard A. Szaras, EAA 145  
1000 Aspen Lane  
Mansfield, Texas 76063*

Have you seen old whatshisname's new fiberglass cowling? It cost him \$150, and four other builders besides you all need one just like it, but \$150 is a lot of money. Boy, if you had a mold, you could knock out a half dozen of 'em for \$15 a piece, and always be able to make a spare. But how do you make a mold? "Quick 'N Dirty", is the answer! We simply use the finished cowling as a mold for making a mold.

FIGURE 1 — Basic Cowl



First, clean the cowling with water and a soft cloth, then wipe it down with toluene or acetone. Now, tape it together exactly as it will be when it's mounted on the airplane.

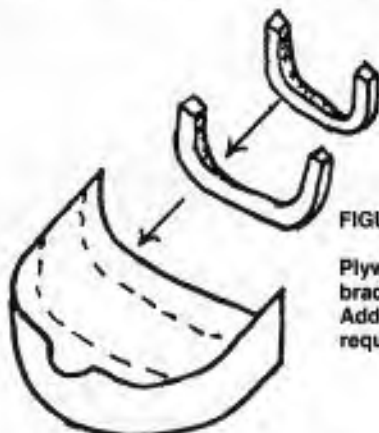
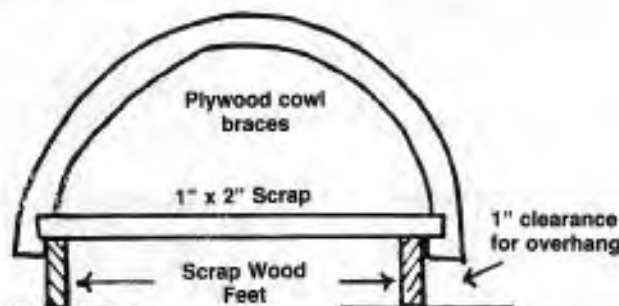


FIGURE 2

Plywood or particle board braces for inside of cowl. Add longitudinal braces as required for rigidity.

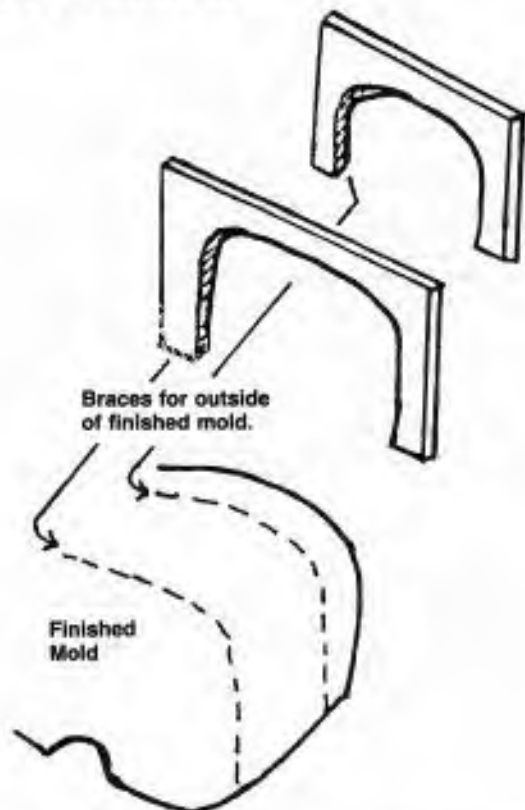
Set the cowling on the floor nose down, and make some braces that will fit inside the cowling. The cowling mold will be made in two parts so brace the cowling accordingly. Whatever you use to brace it, remember that each half must be rigid.

FIGURE 3 — End View Of Braces



Now insert the braces, fastening them in place with bondo blobs. When bondo hardens, remove tape and separate cowling halves. Bondo some 1 x 2 scraps to the braces so that the cowling halves will have some feet to stand on. This allows the fiberglass to extend beyond the edges, when doing the layup.

FIGURE 4 — Finished Mold



At this point, decide if you want a mold that is "good enough" or if you want to go first class. The difference is about an hour's time and about \$5. Of course, by doing "good enough" at this stage you'll probably lose all you saved and then some with each part you make later on. "First Class" means gel coat the mold.

Gel coat is a durable, decorative plastic that is essentially little more than a thickened, pigmented polyester resin, that is catalyzed in the same manner as resin: (with methyl ethyl ketone peroxide). Gel coat can be sprayed or brushed on, with spraying being the preferred method. I've had great results using the Wagner electric airless gun (\$110), and also with the Sears two-way gun (siphon or pressure — \$40). Just remember, work fast, rinse quickly with acetone, disassemble completely, and thoroughly clean all spray gun parts. If you let the gel coat "kick" in the spray gun, you can just write it off as a loss. You have about 8 minutes pot life.

Now let's wax the cowling. Give it five coats of mold release wax. Apply each coat in a different direction, using a straight back and forth motion. Don't miss even a pinpoint area! Let each coat dry a few minutes, and buff each coat with a soft, clean cloth. After buffing the last coat, give the entire cowling one very light



cost of PVA (poly-vinyl alcohol). PVA will guarantee a release. It is soluble with water only. Apply with a soft, lint-free cloth, that is slightly dampened with water. Put a small amount of PVA on the cloth, and apply lightly and evenly. Looking at the surface against the light it should only be slightly coated, as though you breathed on a piece of glass. Don't miss any spots.

Now, gel coat the cowling. You can use plain old general purpose gel; tooling gel is mainly for high production and high temperature molds. Try to use a color different than the color of the parts you will be making. It will then be easier to evenly gel coat the parts you will be making later. Note that even though you may spray the gel coat, it will not be nice and smooth like print. It will have an orange peel texture on the side facing you. The quality of the gel finish is determined by the quality of the surface it is sprayed on. If the cowling was shiny, the mold made from it will be shiny. Any streaks or fingerprints will also show up in the mold.

After gel coating, allow gel to "kick", until it's just barely tacky. Now, pre-cut the first layer of mat, not cloth. Use a thin mat for the first layer. About 3/4 oz. or 1 1/2 oz. per square yard. Never use cloth for the first layer, the weave will "telegraph" through into the gel coat. This will then show up in all the parts made from this mold.

Now measure out the polyester resin and catalyze it "cool" — about 1% catalyst (you'll need lots of time for this first, critical layer). Now paint the cowling heavily with resin, lay the mat on it, cutting it as required to make it lay down. Keep the laps at a bare minimum as these lumps will also "telegraph". Now soak this layer with resin, working the resin in with a brush. Pull all wrinkles out, and then use a 3-inch serrated plastic roller (or your fingers and brush) to eliminate all air bubbles. When all the bubbles are gone, stand back away and study the layup. Now remove the rest of the air bubbles. Make sure the mat is wet out about 1/4 inch beyond the moldline, and scissor trim all around, leaving about 3/8 inch of excess mat.

When the first layup has cured to semi-rigid, razor trim to the mold line, always applying pressure toward the gel coat to prevent delamination. When resin has cured enough to cool, apply about four more layers of mat, using the same procedure — except that we can tolerate some air bubbles. Let the last layer cure for about 12 hours.

Now for the moment of truth. Sand the mold edges all around, just to clean any resin and gel coat that may be bridging the mold to the cowling. Now take a large plastic model propeller and look

for a loose spot in which to insert the tip between the gel coat and the cowling. Now work the tip all around the mold, going ever deeper; now force the mold from the cowling and there you have it! Now replace the mold on the cowling and apply some braces to the outside mold surface to retain its shape.

Now scrub out mold with clean water and soft rag. Let cure about a week before use. When you use the mold for the first ten pulls, always use five coats of wax, PVA, and the gel coat within one hour. Never wax and let sit overnight before gel coating until mold is "broken in". New molds "suck up" wax like a sponge. After ten pulls reduce wax to two or three coats, no PVA. If parts start to "pre-release" before curing in mold, skip wax for one pull.

#### FINAL NOTES FOR POLYESTER MOLDS

1. Try to make mold thickness about three times thickness of the parts made from them — this prevents distortion and allows heat to dissipate.
2. Always catalyze resin and gel coat, "cool" when building molds; it prevents heat distortion and pre-release.
3. Johnsons Paste wax is a good mold release wax.
4. Building raw glass parts in molds will result in pin holes in the surface of the part. If you don't want decorative gel coated parts, try using "Primer-Surfacer Gel Coat". Spray it into mold, lay up part, and the part will come out of the mold with no pin holes, ready for a very light sanding and painting. Whatever type of gel coat you use, remember that finished parts will have mold release wax and PVA on them. To paint over gel, first wash off PVA with water, wipe down with toluene, then wet sand to prepare surface.
5. You can easily modify existing parts by using bondo or plastic type modeling clay. Then build mold on modified part.
6. You can change laminating resin (tacky surface) to finishing resin (non tacky) by simply adding a little wax that has been dissolved in acetone.
7. If laying up in hot weather you can use 30% MEK catalyst, instead of the standard 60% MEK. Also, ask your resin supplier for "summer mix" resin or "winter mix" resin. The difference is the amount of cobalt naphanate accelerator used in the manufacture of resin. High cobalt will mean a purple case to the resin and very rapid gel. If you decide to purchase cobalt naphanate separately and accelerate your own resin, you are asking for trouble. When cobalt and MEK come in contact with each other, they explode violently. So leave that to the pros.

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