



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.

THE ANTIQUE/CLASSIC REPAIRMAN'S CERTIFICATE can become reality . . . with the support of EAA's membership. Please send your individual and chapter response to this proposal, as outlined in last month's CHAPTER BULLETIN, to EAA President Paul Poberezny at Headquarters.

51% INTERPRETATION: Some FAA Inspectors have taken the position of not certifying an aircraft as Amateur Built unless the applicant has personally fabricated and assembled at least 51% of the product. They reach this conclusion by literally adhering to the applicant's statement contained in AC 20-27C Appendix 3 which states:

"I have fabricated and assembled the major portion . . ."

Further they will not accept a revised statement which certifies that the project was 51% completed by amateur builders. This makes it impossible to transfer a project that has gone beyond a point where 51% remains to be accomplished by the eventual applicant for the Experimental Amateur Built certificate.

This is not the intent of the Rule contained in FAR 21.191 which states:

"Experimental certificates are issued for the following purposes:

(g) Amateur Built Aircraft - operating an aircraft the major portion of which has been fabricated and assembled by persons who undertook the construction project solely for their own education or recreation."

This has been brought to the attention of the FAA office responsible for providing field instructions for the certification of amateur built aircraft and they are proceeding to change the statement to indicate that the major part of the aircraft was completed by persons who undertook the project for educational and recreational purposes.

This does not offer assistance to those who are working outside the parameters of the FAR and expecting the FAA to yield to a lesser degree of building by the individuals undertaking the project for educational and recreational purposes.

Another point is that an advisory circular is just that - it is not an FAR. It is a way that the FAR can be met or executed that will be accepted by FAA without questions. There may be other ways to accomplish this end but you have the job of convincing the FAA.

IS YOUR AIRCRAFT REGISTERED? The FAA requires an Aircraft Activity Report every three years. If it is not submitted the FAA may de-register your airplane. The form required is set up to be automatically sent to you by the FAA however if you haven't received a form you may request one from your local GADO. Ask for AC Form 8050-73 (8-75) Aircraft Registration Eligibility, Identification, and Activity Report.

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Designees and Subscribers:

November brings dropping temperatures forecasting what is to come to those of us living here in Wisconsin. It is also a time of crisp, clear days, colorful landscapes and harvesting the crops tenderly nurtured through the summer season. It is the month of Thanksgiving when we should look at and appreciate the bounty that is ours. Those of us in North America should be especially appreciative of our freedom of the air. Many in our world are not given the opportunity to explore our dreams of flight and air above as we do.

November is also the time for Designees to reaffirm their interest in the Designee Program by revalidating on the form supplied in the October issue of the *DESIGNEE NEWSLETTER* or their Chapters' 1984 Status Report supplied in the October issue of the *CHAPTER BULLETIN*. If you or your Chapter need another of these forms contact me at EAA headquarters immediately. Let's start 1984 off with 100% of our Chapters and Designees revalidating for the new year.

As the cooler weather draws many EAAers to their workshops remember there is always time to do it right . . . and the safe way.

Chuck Larsen, Editor

EAA'S SIMPLIFIED TYPE CERTIFICATE PROPOSAL will be the subject of a meeting of approximately 40 representatives of aviation groups, manufacturers, FAA and EAA staff members this month. This meeting, at the EAA Aviation Center, will focus on the development of a simplified procedure to certify light, two place aircraft completely manufactured or in kit form. The EAA-ARV Simplified Type Certification could be a strong shot-in-the-arm for general aviation. Look for a report of this momentous meeting in the December *CHAPTER BULLETIN*.

EXPERIMENTAL AIRCRAFT REGISTRATION hit an all-time high with the FAA figures released at the end of September. Registrations in the following experimental and racing aircraft were:

Amateur Built - 8703

Exhibition - 1418

Racing - 485

This total compared with the figures from January 1st of this year show a growth of 1732 aircraft in these categories. A growth of 1490 amateur built aircraft in the same period seems to mark this exclusive group as the largest segment of aircraft manufactured in the United States.

LETTERS 'N SHOP TALK



Pictured above is the EAA Aviation Foundation's Curtiss Robin that suffered the damage shown as on a flatbed trailer as it was being transferred from our Burlington to our Hales Corners facility. The basic cause was the omission of two structural cross brace wires. Look for a feature in the December issue of *SPORT AVIATION* by EAA President, Paul Poberezny for a complete explanation.

HOLDING SOLENOID

From Ted Travis, EAA 100657, D/N 1291
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Are you looking for a holding solenoid which is actuated by the "Master Switch"? Ran across one which looks good, but has not been flight proven yet. Part number is 121613C1, stocked by International Harvester, and is used on their late model trucks. Overall size is approximately 2" in diameter and 2" high; it has two metal mounting tabs and weighs 9 ounces. International runs everything but the starter through this solenoid so believe its capable of everything needed in a Custom Built except the starter circuit. And another good point is that the retail price is \$13.49.

\$1.89 BRAKE LININGS

From the West Coast Cessna 120/140 Club Newsletter

Goodyear brake linings are now priced unbelievably high. The lining most commonly used, part number 95-11261, costs \$12.70 from Cessna or \$9.75 from the mail order catalogs — for a disk one inch in diameter and a half inch thick — and four are needed!

Those of you who operate aircraft in the experimental category with Goodyear brakes can make linings at a fraction of that cost.

Two tools are needed: a drill press (preferably) or an electric drill; a hole saw consisting of a mandril and a blade. The Black & Decker U1240 mandril and U1274 1 1/2" blade (its I.D. is 1") are ideal and cost \$4.59 and \$1.89, respectively, at a neighborhood hardware store. Other brands would probably do as well.

Obtain the lining material from a supplier of heavy equipment or industrial linings. See Brake Lining or Friction Material headings in the yellow pages. Show the dealer a Goodyear lining and ask for some half-inch thick, flat material that is vaguely similar. Not much is needed; a piece the size of your palm is enough to make two sets of linings. Don't be put off by the dealer's reasoning that he can't supply you because of differing physical characteristics or other technicalities; just take the hardest material available because it will wear longest. The dealer may give you a scrap of material free or charge a few dollars for it.

Assemble the hole saw, mount it in the drill, and cut out the linings. The blade will get duller as each lining is cut and it will smoke like crazy on the last one. When finished, discard the blade and keep the mandril to use again. Touch up the linings with a file as needed. You have just made a set of brake linings for the cost of the blade plus whatever the material may have cost.

STRUCTURAL MATERIALS

By Hugh MacDonald, as published in *SPORT FLYING*, The Magazine of the Amateur Aircraft Constructors of New Zealand

Structural Materials require reliable properties of strength, stiffness and fatigue-life maintained by chemical stability, i.e. resistance to rusting, corroding, ultra-violet degrading and etc., over a wide range of ambient temperatures and atmospheric content. Most structures require protection. Some corrosion is insidious. Intergranular corrosion can occur in some metals and alloys so it is necessary to weld and braze with the correct fillers and techniques.

Copper can be oxygen embrittled when hot. Steels can be subject to hydrogen embrittlement during some welding and plating processes.

There is a wide range of materials and a designer will select with regard to structure, demand and material compatibility, insuring that design loads don't exceed recognized fatigue limits, way below the "ultimate tensile" figures in the following list. Fibrous material properties extend along the fibers.

TENSILE STRENGTHS

Tons per Square Inch

	Ultimate	Yield	Specific Gravity	Strength To Weight Ratio	Elastic Modulus 1,000,000 psi
Mild Steel	30	25	7.85	3.82	29
Piano Wire	160	160	7.85	20.4	30
Axle Steel	160	90	7.85	12.7	30
2024 T4	30	20	2.6	11.5	9
7075 T6	33	29	2.7	12.2	10
Spruce	4.4		.44	10	1 to 2
Ash	7				1 to 2
Pine	4 to 5.1				1 to 2
Teak	7				1 to 2
Oak	7				1 to 2
Mahogany	7				1 to 2
Epoxy Resin	1.5		1.2		.05
Glass Chopped	7		1.8	3.8	1.4
Strand Mat. 70% resin	15		1.74	8.6	2
Woven E Glass 40% resin	44		1.7	25	7
E Glass Fibers	112		2.54	44	10
S Glass Fibers	193		2.54	79	11.7
Carbon Fibers	180				53
Carbon Fibers	193				26
Kelvar	225				14

GLASS CLOTH TECHNIQUE

From THE MINNESOTA COMPOSITE BUILDER
EAA Chapter 587's Newsletter

Mike Lenarz, EAA 112633, says that masking tape on cut glass cloth prevents unraveling and fraying of fiber ends.

The Quickie boys recommend using masking paper for wetting out and laying up multiple strips of cloth. This lets them place the tapes accurately without stretching or warping. When all is positioned, peel the paper and inspect the work.

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.

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TECHNICAL TOPICS

COOLANT - LUBRICANTS FOR THE HOMEBUILDER

By Larry Corbin, EAA 34468, D-N 1626
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There are many times when coolant - lubricants are useful for the homebuilder. Examples are drilling deep holes, reaming, tapping and honing. Those who live near machine shops can find many compounds made specifically for their needs. Many of us, however, live in areas where such things are either not available or available only in large quantities.

The following table and list are based on materials which are readily available. They may not be as good as some of the industrial materials but they do work satisfactorily in most cases.

	DRILL	REAM	TAP	HONE
STEEL	1	2	3	4
COPPER & ALUMINUM	1 or 2	2	5	4
SOFT PLASTIC	6	6	7	N.R.

1. Soluble oil and water. Water is an excellent coolant and a fair lubricant but, of course, causes rust. Soluble oil solves the rust problem and increases lubricity. A useable substitute is sold in auto supply stores as "anti-rust compound and water pump lubricant". Mix one can with one or two gallons of water. If rusting occurs, ratchet the mixture. The mixture may be reused by first removing the large chips with window screen material and then filtering with a paper coffee filter or milk filter.

2. SAE 10W motor oil or automatic transmission fluid. Reaming always required generous lubrication for best results. Generous lubrication also avoids galling of copper and aluminum especially with the softer alloys.

3. Vegetable shortening works well and is convenient. A mixture of oil and lard may do better for tough jobs but will turn rancid at room temperature in just a few days.

4. Automatic transmission fluid works well with coarse honing stones, fuel oil with fine stones, and a mixture of the two for intermediate stones. Please observe common sense safety precautions when working with flammable liquids especially since they may become hot and atomized in any machining process.

5. Gear oil

6. Soap and water. This must be real soap, not detergent.

7. Solid soap. Again, this must be real soap.

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INSPECTION OPENINGS AND COVERS

From Rich Hartzell, EAA 49767, D-N 16
This information was provided in response to a request from EAA's Technical Safety Committee for such materials

The following information concerns inspection covers and common errors made by builders. I have seen Builders sometimes forget inspection rings and openings completely, until found on next inspection, then have to install and mess up a nice finish and dope job. Some builders install rings in wrong places or where not needed, and then where needed for importance there is no opening at all.

I find the problem with plastic rings that are not doped down enough in time come loose, and then it is difficult to secure down to a fabric once it has been cut open for inspection. The best way for a builder to secure the plastic ring to fabric is to make a fabric patch using some material to cover with about 1" larger in diameter than ring and dope to fabric. You won't have to worry about the plastic ring becoming loose over a period of time when the inspection covers are being popped off.

Builders should keep in mind that areas in wings and fuselage will need inspection, and should locate the opening in areas to fittings. Like wing attachments at spars, bellcranks where cables and pushrods attach, and at tail post area in fuselage for tail wheel attachment and for inspection support structure.

The standard plastic ring is about 3 1/2" inches inside diameter, and in most cases is large enough to inspect and replace parts, if not too large, using one hand and fingers.

I find some inspection covers that tend to move in flight, and it causes fretting marks on fabric. I like the old style inspection covers used on Cubs, Taylorcraft and Champs, that have been doped to keep the cover from moving. Some of the new manufactured sheet metal rings don't have the depression to lock onto the ring, and the only thing you can do is bend the steel clip end with pliers to pinch the cover to the ring.

In certified aircraft fabric work a good policy is to keep fabric cover until finished so reference can be made to original to find where to put inspection covers.

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