



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 and Subscribers.

Preparations for this year's Convention are in "high gear" as is the work at the new Aviation Center. Through the combined efforts of contractors, EAA staff and a strong volunteer effort both the Convention Site and Museum facility will continue to reflect EAA's reputation for quality and development for OSHKOSH '83. Volunteers have, and will continue to play an important role in EAA's continued success. YOU can be a part of this volunteer effort in preparing the Convention Site or Museum facility by contacting Vern Lichtenberg, EAA Site Supervisor at Oshkosh (414) 426-4800.



JULY 30 - AUGUST 6, 1983
WITTMAN FIELD
OSHKOSH, WISCONSIN

Your special skills are needed during the Convention to support the Workshop Programs, the Technical Information Center, the Designee Symposium and other areas of activity. Please contact me at Headquarters before and in the Chapter/Volunteer Center during OSHKOSH '83 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 a feeling of accomplishment; than they give. We invite you to become a part of the "inside" of EAA as a Volunteer worker.

Attend the CHAPTER SUPER SPECTACULAR AT OSHKOSH '83. EAA President Paul Poberezny's traditional Monday morning meeting with Chapter Officers has become a highlight of each Convention's activities. OSHKOSH '83 brings a greatly expanded gathering that can only be described as a "Super Spectacular" for Chapter Officers and members as well as EAA members at large.

SPECIAL FEATURE ISSUE INCLUDING FAA ADVISORY CIRCULAR 20-27C Certification and Operation of Amateur-Built Aircraft, Dated 4/1/83.

The EAA presents the material and ideas herein only as a clearing house of information and as a forum for the exchange of ideas and opinions. No responsibility or liability is assumed, either expressed or implied, as to the suitability, accuracy, safety, or approval thereof. Any party using the suggestions, ideas, or examples expressed herein does so

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Paul will open this concentrated information session addressed to the Chapter Leadership of our organization. He will be followed by EAA and EAA Aviation Foundation personnel and other EAA leadership to present an inside view of the far-reaching activities of our organization. The materials presented will make you a more informed and effective Chapter leader with a better understanding of your personal and Chapters importance in the present and future activities of EAA and the EAA Aviation Foundation.

This meeting is a MUST for all Chapter leaders and members attending OSHKOSH '83. Put it on your schedule for the Convention.

What: CHAPTER SUPER SPECTACULAR

When: Monday, August 1 - 9:00 a.m.

Where: Forum Tent #2 at the site of OSHKOSH '83

The EAA DESIGNEE FORUMS AT OSHKOSH '83 will be presented from 1:30-2:45 p.m. in the Chapter/Designee Forum Tent (Forum Tent #8) in the "hub" of Convention activity just north of the N.A.S.A. Exhibit Area. The day's topics and those presenting the programs follow.

Sat., July 30	FAA Advisory Circular 20-27C FAA Designated Airworthiness Representation	Larry Nelson, FAA Engineering & Mfg. Branch, Chief Eng. & Mfg. District Office #43
Sun., July 31	Questions Builders Should Ask Designers	Ted Slack, EAAC Technical Committee/ EAA Safety Committee
Mon., August 1	Designee Visits To Wooden "homebuilt" ultralights	Stephen K. Wood - Sport Flight Engineering

In addition to those scheduled above, the "Dean" of EAA Designees, Tony Bingelis and others have been invited to make presentations. Check the July issue of the DESIGNEE NEWSLETTER and/or the Chapter Center for the final schedule for these forums for Designees and builders at OSHKOSH '83.

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FOLDING DIRECTIONS

The enclosed copy of FAA Advisory Circular 20-27C should be removed from the envelope and folded to form a 5½" x 8½" booklet. A staple or staples in the spine of the booklet will hold the pages in position.

THE EAA DESIGNEE

By Lance Zellers, President of National Capital Chapter 186 as published in STICK AND RUDDER, their Chapter Newsletter

The EAA DESIGNEE is a Chapter member who has special knowledge or skills in aircraft design, fabrication or testing. He is a local, available "expert" who can provide guidance and builders' assistance. He is a volunteer. He helps all of us to build better, safer aircraft. Our Chapter Designees are very active people and their range of knowledge spans ultralight, composite, metal, wood, steel tube, welding and fabric construction techniques. Draw these folks into your building plans early. Have them look at **early** samples of your craftsmanship. It could save time, frustration and DOLLARS later. These men do not wear a sheriff's badge — they can't stop you from your efforts. Use their advice and counsel. If the Designee is in doubt of any facet of your technique/aircraft you may decide to ask for a courtesy inspection by the FAA. Those who are

not yet builders may want to arrange to be there when a Designee, or the FAA, visits. Let us make this Chapter the most professional in all of EAA in our approach to safe building and the sharing of that vast accumulated knowledge of our own members. By the way, since that DESIGNEE is volunteering his time, his expertise, and his transportation, why not fill his gas tank and/or his stomach?

Is there anyone who would be interested in forming a team of advisors for test operations. No, I'm not looking for test pilots. A new builder has probably allowed his flying skills to atrophy. He may be physically tired from the last minute hustle to prepare for this event. He is on an emotional high in anticipation of the first hop. He may be, frankly, unqualified for the type of aircraft he has built. Let's face it — the builder may not be prepared for his first flight! This Chapter should be able to field an experienced **team** to assist the builder in planning, preparing, and conducting a meaningful, safe test flight program. Volunteers? . . .

DESIGNEE/BUILDER GUIDELINES

*By Ray Morin, EAA 1565, D/N 1445
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Building an amateur-built aircraft can and should be fun as well as educational. There are several steps that the builder can take to assure that his project will advance smoothly, with a minimum of frustration and delay.

Having decided which aircraft he wants to construct, the builder should contact the nearest FAA District Office and learn the ground rules and develop a good working relationship with the FAA in the very beginning. It is unfortunate that so many amateur builders spend many thousands of dollars building an aircraft but are reluctant to write a letter and spend the postage to mail it to the FAA office that has a great deal of information he will need. The FAA is there to help the builder if they will contact them by letter, telephone or by a personal visit.

It is false economy to fail to get the applicable FAR's, Advisory Circulars and manuals such as the EAA's Custom-Built Sport Aircraft Handbook, Amateur-Built Aircraft Service and Maintenance Manual, logbooks and technical manuals at the very beginning of the project, since the cost is so minimal and preventing even one mistake can save the builder more than the combined cost of all of these publications, not to mention delays and the cost of repairs or replacement.

The builder should maintain a file of all bills of sale, invoices, purchase records, etc. on all materials, kits and assemblies that will be part of the aircraft. Keep all records in one location, no elaborate file set-up is necessary, a cardboard box or large envelope can be used as storage for records and can eliminate much searching if and when the FAA Inspector asks to see them (and he probably will). Take photographs of all assemblies with all control systems in place prior to covering.

When the completion of the project is near, the builder should complete forms supplied by the FAA, such as Affidavit of Ownership, request for an "N" registration number, Application for Registration and an Application for an Airworthiness Certificate. The forms should be typed or clearly printed with all pertinent information entered. They become a part of the permanent records of the aircraft. The FAA will not accept forms that are illegible or incomplete. Be sure the forms are complete and readable to prevent delays in certifying your aircraft.

Very few builders are experienced in all the skills involved in building an aircraft from blueprints to flight line. The smart builder seeks the help of other builders or persons experienced in the various skills applicable to the construction of his aircraft, such as welding, riveting, woodworking, composite materials, electrical and hydraulic systems, powerplant, etc.

The Experimental Aircraft Association has recognized certain individuals, based on their Chapter's recommendation, to help amateur aircraft builders by providing advice, support and guidance during the construction of the aircraft. They help to assure that a safe aircraft will be presented to the FAA for Airworthiness Inspection and Certification upon completion of construction. These EAA Designees will become more important to builders and will be called upon more frequently with the adoption of Advisory Circular 20-27C. The FAA will no longer conduct in-process or pre-cover inspections, limiting their visits to a final inspection at the time of Airworthiness Certification and releasing the aircraft for flight testing.

In view of the new AC 20-27C, it is important that builders and Designees receive guidance on FAA Regulations, inspection procedures, completing forms, etc. The following may be helpful to both the builders and Designees.

Designees must remember that although they are kindly giving their time to the builder, they are also a guest in that person's house or workshop and should conduct themselves accordingly. The impression that the Designee makes on the builder, on the first visit will have a lasting effect, good or bad, and could well gain or destroy the builder's confidence in the Designee. When visiting projects, the Designee should ascertain that all the appropriate drawings and applicable drawing changes, if any, are available and that any deviations from the drawings are approved by the designer or an aeronautical engineer. Any material substitution should also be approved. The builder should have test samples of welding, foam and fiberglass bonding samples on composite type aircraft and glue joints from each batch of glue mixed on wood aircraft. All glue joint and bonding test samples should be identified as to their respective location on the aircraft as well as the date they were done. The FAA Inspector may ask for these samples and having them available will facilitate the FAA inspection and help inspectors make knowledgeable judgments.

It is important to review the drawings for errors that could be costly to the builder or result in an unsafe condition. The builder should also be encouraged to be inspectors themselves and be critical of their work since his life may depend on the quality of their work and evaluation.

Designees should advise builders to contact the appropriate local FAA Office to discuss their project and what the FAA will require of him. One of the first things that the builder should get is a copy of Advisory Circular 20-27C, Certification and Operation



of Amateur-Built Aircraft, available free at the FAA District Office or from: U.S. Department of Transportation, Publication Section M443.1, Washington, D.C. 20590. The Designee should also obtain a copy of this Advisory Circular. (A complete copy of AC 20-27C is enclosed with this issue of the DESIGNER NEWSLETTER.) Since these new FAA rules will require evidence of inspection, such as a logbook entry signed by the builder, describing all inspections conducted during construction of the aircraft. The builder should be advised to obtain the EAA Amateur-Built Logbooks, the EAA Amateur-Built Aircraft Service and Maintenance Manual and the EAA Amateur-Built Aircraft Construction Log to keep a complete record of materials, data, etc.

NOTE: Designees should not make any entries nor sign any logbooks in their capacity as an EAA Designee during their visits to projects.

Many individuals who build their own aircraft have had little or no experience and are in need of counsel and advice in fabrication methods, processes, tolerances, corrosion prevention, assembly and workmanship. It is very important that the Designee limit his advice to his own qualifications and recommend the builder consult the designer or a qualified person on matters that he is not familiar with. The Designee can do much to help the builder to present to the FAA Inspector a safe aircraft that is in compliance with regulatory requirements so it can be certificated with a minimum of daily and maximum confidence.

Inspection checklists should be used for both the in-process and the final inspection prior to FAA certification inspection. Some items that should be checked are:

1. The fuel tank filler must be marked "fuel" and marked with the minimum fuel octane permitted and the usable tank capacity.
2. A cabin or cockpit placard must be installed on all aircraft, in full view of all the occupants: "Passenger Warning - This aircraft is Amateur Built and does not comply with Federal Safety Regulations for Standard Aircraft."
3. A fireproof identification plate must be secured to the aircraft in such a manner that it will not be easily defaced, removed, lost or destroyed during normal service in an accident. It must be installed at an accessible location near an entrance, or if it is legible to a person on the ground it may be located externally on the fuselage near the tail surfaces. The data plate must be marked by a fireproof method such as stamping, etching or engraving.
 - a. Name and address of the builder (not designer)
 - b. The aircraft model
 - c. The aircraft serial number
 - d. Date of manufacture
 - e. Empty weight
 - f. Maximum weight
 - g. Engine make
 - h. Horse power

The model and serial number may be whatever the builder wishes to assign, but the model should not be easily confused with commercially built aircraft (such as Bonanza, Cherokee, etc.)

4. The word "EXPERIMENTAL" must be displayed near each entrance to the cabin or cockpit in letters not less than 2 inches nor more than 6 inches in height.
5. The fuel shutoff must be in a location where it can be operated by the pilot while wearing a shoulder harness and seat belt.
6. Floor board fasteners should not be located so that they could catch the pilot's heels while operating the rudder pedals if the fasteners should become loose.
7. Positive control travel stops should be installed to limit the rudder, ailerons and elevator travel to the maximum degrees of deflection called for that particular aircraft design.
8. Control cables or push rods must not be interfered with by any structure, fuel lines or electrical cable throughout their operating range. Control surfaces must operate in the proper direction.
9. Special attention should be given to prevent foreign objects from entering places where they might jam the controls.
10. On gravity fuel systems, a flow test should be made with the aircraft blocked up on the ground with the thrust line at the maximum climb attitude to assure an adequate fuel supply to the carburetor during climb. A complete procedure for a fuel flow test is described in the EAA's Aircraft Builders Handbook.
11. All bolts subject to rotation must have a castle nut and cotter pin.
12. Registration marks ("N" number) must be displayed on the vertical tail surfaces or the sides of the fuselage. The markings must be a minimum of 3 inches high on aircraft with a maximum cruising speed not exceeding 180 knots (207 miles per hour) on aircraft operating above these speeds the registration marks must be at least 12 inches high. FAR 45.29 defines the size and proportion for registration marks on all types of aircraft.
13. Check that bellcranks cannot lock in an over cam action in full control travel.
14. There should be no openings in the fire wall that could let fumes or flame into the cabin or cockpit in case of engine fire.
15. If a baggage compartment is installed, check that the compartment is placarded with maximum baggage weight. Provision should be made so articles put in that compartment cannot escape.
16. The Registration Certificate and the Airworthiness Certificate and Operating Limitations should be displayed in an appropriate folder.
17. A proper Weight and Balance evaluation must be conducted and available to be checked by the FAA Inspector.
18. Check that doors or canopy latches properly and cannot accidentally open in flight.

At the time of the FAA inspection, all the inspection access covers and removable fairings should be removed. The engine cowlings should also be opened. If this is done prior to the FAA Inspectors arrival, it can save valuable time if the inspector is on a tight schedule.

When speed taxi tests are conducted, be sure to have a sufficient amount of fuel in the tank to safely complete a go around in the traffic pattern if the aircraft should inadvertently become airborne past the critical runway point. That critical runway point should be established and marked before the taxi tests.

NOTE: Passenger warning placards and Aircraft data plates are available from EAA for \$4.00 post paid.

EAA Technical Publications currently available to help Builders and Designees:

Custom-Built Sport Aircraft Handbook	\$4.25 ppd.
Pilot Reports & Flight Testing	\$4.40 ppd.
Modern Aircraft Covering Techniques	\$4.40 ppd.
Aircraft Powerplant Handbook	\$5.00 ppd.
Custom Aircraft Building Tips Volume 3	\$4.25 ppd.
Custom Aircraft Building Tips Volume 4	\$4.25 ppd.
Metal Aircraft Building Techniques	\$4.40 ppd.

EAA's Technical publications are being revised. The following will be available in time for OSHKOSH '83.

CAM-18 (Reprint)	
EAA Amateur-Built Aircraft Service & Maintenance Manual	
EAA Amateur-Built Aircraft Construction Log Book	
EAA Pilot Log Book	
EAA Amateur-Built Aircraft Log Book	
EAA Propeller/Rotor Log Book	
EAA Engine/Reduction Drive Log Book	

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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