



EAA[®] Technical Counselor News

FEBRUARY/MARCH, 1987



AMATEUR BUILT PITTS S2S-E

Dewey E. Ballard, of Prairie Village, Kansas, recently completed a Pitts S2S-E for the Blackhawk Aerobatic Team. He had hoped to have it finished by last Christmas, however after it was decided to make it the lead airplane instead of the slot machine, many changes had to be made. Dewey says most of the additional time was spent in walking back and forth between the workshop and the hangar to get measurements from one of the other S2's in the Blackhawk fleet. Dewey found out that it is possible to make a copy of a complicated airplane, but it would have been a far more pleasant task if construction plans had been available and not just a parts catalog. This airplane is covered with 2.0 ounce polyester fabric and 30 coats of dope. The lettering and striping was done with Imron and the metal and fiber-

glass areas were finished in Dupont Dulox enamel. After aging, all fabric areas were rubbed five times (600 paper, red compound, white compound, anti-swirl compound and paste wax). The engine is a Lycoming AE10-540-D4A5. Performance has been equal to or better than that of the factory built model. The team has been performing every weekend this past summer from coast to coast and they have told me that the new machine has given them no trouble at all. Dewey reports that the Blackhawk airplane was probably the last one that he will ever build from scratch. He just finished covering a new Pitts S1S for a friend, and this winter he will recover a Pitts S2A down in Texas and an S2S in Kansas City. When that is over, maybe he can find time to recover his Starduster!

TECHNICAL COUNSELOR NEWSLETTER STAFF:

Tom Poberezny	Publisher
Ben Owen and Ann Ruby	Editors
Mike Drucks	Art Director

Editorial

by Tom Poberezny



What is EAA's role in aviation? To answer that question you have to take a look at a number of things, such as the diversity of our membership, as well as the programs and services that we offer. Our members range from owners, pilots, and builders, to enthusiasts who dream of some day being able to fly their own airplane. The focal point has been . . . and will continue to be . . . the homebuilder. But we cannot maintain the freedoms that we have had if we keep a narrow viewpoint. Because of the successes and high standards developed by our members, EAA has been called upon to take on broader responsibilities as relates to work that we now perform with government (FAA and DOT) as well as politicians who can, with the stroke of a pen, take away many of our hard earned freedoms and rights.

An important keystone in the EAA philosophy has been self-help and education. The Technical Counselor Program is a prime example of this. Over the years, Technical Counselors have assisted thousands of EAA'ers with their aircraft building projects. Last year over three thousand visits were made. This does not take into account the tremendous wealth of information given to EAA members at chapter meetings and other related activities.

The Technical Counselor Program demonstrates to government, as well as the public at large, our commitment to quality and safety. We want to be sure that any project presented to FAA for inspection meets the highest standards of safety. "Zero" defects is our goal. The technical Counselor Program has received the respect of FAA on a nationwide basis. Each of you is looked upon as an asset that meets two very important goals. . . safety and the promotion of aviation.

Throughout EAA's thirty-four year history there have been very few regulatory changes in the experimental/amateur built program. A major reason why this impressive record is intact is the work that each and every one of you do.

EAA, its members and its programs, will have an even bigger impact on aviation in the future. You can be proud of your role knowing that you have not only made a major contribution to your fellow EAA members, but to the overall aviation community.

EDITOR'S COMMENTS

by Ben Owen, Technical Counselor Administrator

1. **TECHNICAL COUNSELOR INSURANCE:** We have an insurance policy that covers Technical Counselors when they are engaged in the program. This covers you strictly when you are working as a volunteer, visiting aircraft projects on behalf of EAA and/or your chapter. It does not cover any work you might do for compensation, and if you are an A&P, it does not cover you during the time that you are following that occupation. One of the requirements for this insurance coverage is to have a signed visit report from the builders you visit on file at EAA Headquarters, one on each airplane is enough, but we recommend that you send in one per year on long-term projects. Occasionally, we lose something, too! If you want the coverage, send in the forms, please.

2. **POWERED GLIDERS:** We have some information here at EAA Headquarters that might be of interest to those

who are visiting or building powered gliders. At this time, the pilot of a powered glider does not need a medical certificate. For details on this, write to me here at EAA Headquarters.

3. **ANNUAL ACTIVITY REPORTS:** The annual minimum activity expected of a Technical Counselor is to visit three aircraft, present three technical programs at a chapter meeting, or to send in three technical tips to Headquarters for use in either the Technical Counselor Newsletter of the Craftsman's Corner column - or any combination of three of the above. If, when you send in your report, you haven't been engaged in these activities, then we have to turn around and write to your Chapter President to verify your activity. It would make it a little easier for us if you would put down your actual activity the first time. Thanks for your help on this one. Next year, the revalidation will be easier, but our insurance company has certain things they expect of us on this, too!

Notices

4. **THE BEST REFERENCE FOR EXPERIMENTAL, AMATEUR BUILT AIRCRAFT** is the Operating Limitations that should be kept in the cockpit of the airplane. You will note in reading FAR Part 43.1(b) that it states, "This part does not apply to any aircraft for which an experimental airworthiness certificate has been issued, unless a different kind of airworthiness certificate had previously been issued for that aircraft." This means that Part 43 applies to amateur built aircraft only as your operating limitations do state. The operating limitations on most amateur built aircraft will say that Part 43(d) should be used as a guideline for the annual compliance inspection, and that any major alterations to that airframe will have to be approved by the FAA. What this means is that the builder can maintain the aircraft during the course of the year, and also do the annual compliance inspections. The purchaser of an amateur built aircraft can do the maintenance during the year, but does have to hire an A&P to do the annual compliance inspection. You don't, at this time, specifically need an A&P mechanic to work on the airplane during the year, if you buy the aircraft. The purchaser can work on an airplane. This is a "gentleman's agreement" with the FAA, and so far has worked well for all parties concerned. The same would apply to an experimental exhibition aircraft, a fact that is not generally known.

ADVISORY CIRCULAR 43.13-1A

Advisory Circular 43.3-1A was printed 14 years ago, in 1972. The 43.13-2A was printed 9 years ago in 1977. One of our manuals titled the "Aircraft Repair Manual" has the complete 43.13-1 and 43.13-2 in very fine print. This manual is \$12.95 post paid. The CAM 18 was printed back during WWII and has much the same information as the AC 43.13 would have with one big advantage - CAM 18 is printed in large print and is available from the EAA for \$6.50 post paid. The drawings and written content of the AC 43.13-1A, 43.13-2A and CAM 18 are very much the same.

The U.S. Government is revising the Advisory Circular 43.13-1A and it will probably take them at least a year to update it and add such things as composite aircraft construction tips, etc.

TECHNICAL COUNSELOR CHEVRONS

Technical Counselor chevrons are automatically supplied

for those Technical Counselors that have completed 5, 10, 15, or 20 years of service. If you don't get your chevron when you receive your renewal package in 1987, and you feel that you should have one, please drop a note to Ben Owen, Technical Counselor Administrator, EAA, Wittman Field, Oshkosh, WI 54903-3086. These chevrons, or "hash marks" are attached below the patch that all new Technical Counselors are given. Also, in January 1986, ALL Technical Counselors received a new patch and the appropriate chevrons.

CRI-CRI SAFETY NOTE

Please be advised that there is an Advisory for the prevention of flutter in the Cri-Cri available from the FAA, and the purpose, simply stated, is "to alert all owners and current builders of the Cri-Cri airplane of the importance of the correct assembly of the aileron flap control systems, and several reported incidents of aileron flutter in the 'Cri-Cri'. These occurrences have been attributed to a slight sloppiness in the aileron/flap mixer control system. Slight is emphasized, since it has been determined that there is very little, if any, margin of error in the assembly of this system.

The above is good advice for any aircraft - try to get the builders to eliminate the slop in the systems!

HAVE A GOOD DAY! Ben and Ann

MORE ON STICKING VALVES

From Technical Counselor Bernie Holloway of Waupun, Wisconsin.

"Hi, Paul and Ben:

I read the article about sticking valves to which I would add a note. Since Lycoming engines such as the O-290 and O-320 type have hydraulic valve lifters with no mechanical clearance adjustment except selecting the proper length push rod, it is possible to have a valve seated so deeply that, with the cylinder cold, the push rod is long enough to hold the valve open. This can produce a condition where only a short run of the engine will cause the cylinder to lengthen enough to bring that cylinder in again normally. This condition can be detected by cranking with the switch off, or listening to the engine coast after shut down.

It's possible also that this could be mistaken for a sticking valve.

Bernie Holloway, T.C. #832



Welder/Technical Counselor Bob Caravas sent these pictures of his personal project - a Starduster Too.



Bob's firewall on the Starduster Too is very nicely decorated!

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Photo Gallery



The builder is James Chestnutwood, right, of Holland, Ohio, handing his Technical Counselor, George Shanks, a signed visit report. George is obviously the "cookie monster" in this group!



Jim Chestnutwood's KR-1 project was a nine year project with excellent workmanship, about 30 percent complete. George checked the flaps, wings, tailfeathers, cables and engine mount.



The KR-1 made an excellent project visit for the local chapter members. The aircraft is being worked on in the inverted position.

4



This is George Shank's personal project, a KR-2. George is a Technical Counselor from Oregon, Ohio. This ship is powered with a VW of 50 HP (1763 cc) and project is about 80 percent done. Hoping for a spring flight!



Technical Counselor #1452, Leonard E. Milholland, of Brookshire, Texas, sent this photo of his super light weight Sorrell Guppy (left) and his Corben Jr. Ace (right), both built by Leonard Milholland.



This photograph of Stanley and Nora Mockrud (Technical Counselor #431 of Madison, Wisconsin) was sent by them recently. I want to thank Stanley for his years of dedication and effort as a Technical Counselor and for his efforts on behalf of sport aviation in general. Stanley has retired as a Technical Counselor due to ill health. He will be missed!



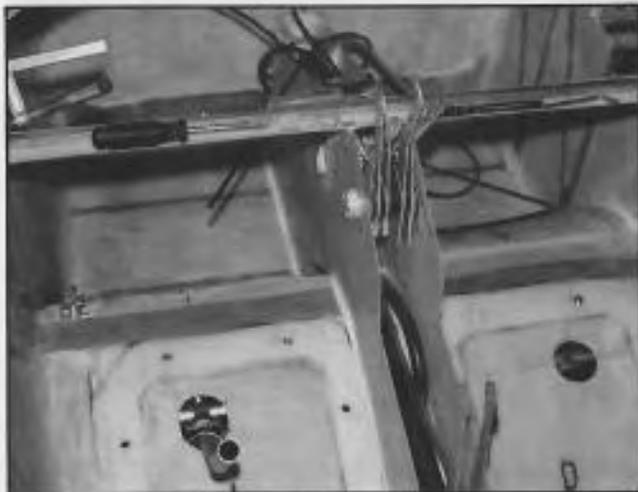
Technical Counselor Leonard E. Milholland took this picture of Bill Stokes Smith Miniplane, a project that seems very close to completion. It has a 150 HP Lycoming, full electric, aux tank and a lot of other items. Bill Stokes has just completed a Skybolt and has rebuilt many factory aircraft. Bill hails from Waller, Texas.



Alex Sloan, a Technical Counselor from Florence, Alabama has an excellent example of a Technical Counselor's personal project in his RV-3. It is painted in basic yellow with a green stripe.



Homebuilding in Italy is alive and well! These photographs are of Alexandro De Curtis' KR-II from Pistoia, Italy. The wood workmanship appears excellent.



With what looks very much like a multi-engine quadrant, you can see some of the excellent craftsmanship on this KR-II. Alexandro does excellent work!

Composite Corner

FIRST GLASAIR III KIT DELIVERED

Stoddard-Hamilton Aircraft, Inc. delivered the first of its new Glasair III kit aircraft on October 21, 1986, just two months after the completion of test flights on the prototype model.

The Glasair III is the newest and fastest of the Glasair aircraft, using a Lycoming 300 HP engine, cruises at a top speed of 300 MPH and a range of 1,500 miles.

The company reports impressive sales of Glasair III kits - payment has been received on over 30 kits since the introduction of the Glasair III at Oshkosh in August 1986, according to Stoddard-Hamilton President, Ted Setzer. Sales of the much improved and easier to build Glasair II RG, FT and TD kits are equally as high.

The new Glasair III and II kits incorporate numerous improvements over previous Glasair kits, which make them substantially easier to build. Estimated construction time has been cut by over 1/3 from previous Glasair kits.

Many of you have read the article on spin testing the Glasair. The company invited Bob Herendeen to spin test their aircraft, and he did some extensive research on the spinning ability of the Glasair. Anyone interested in this can write to EAA for a copy of the Glasair News, Third Quarter, 1986, Newsletter #12. You may also write to Stoddard-Hamilton, 18701 - 58th Avenue N.E., Arlington, WA 98223, telephone (206) 435-8533, for the same copy.



WARNING! CHECK YOUR EPOXY!!

FROM HAWK TALK, The Seahawkers Newsletter, new address: AERO COMPOSITES, 1201 Fourth St., P.O. Box 246, Fulton, IL 61252, telephone (815) 589-3300, c/o Karen and Craig Huizenga.

THIS ARTICLE IS VERY IMPORTANT! Read it carefully!

We have had several of our builders call regarding the age and shelf life of their Safe-T-Poxy. It has come to our attention that there are many builders who got their kits during 1983 or early 1984 and have just started on the kit or are still working with the original epoxy that came with the kit. Although it has been sort of unwritten common knowledge that Safe-T-Poxy stays good for about 2 years, and although we have never had Safe-T-Poxy go bad even after 2 years, we decided to contact Applied Plastics Company (APCO), makers of Safe-T-Poxy, and get some detailed information.

As you will all notice on your bottles or pails of Safe-T-Poxy, the shelf life is listed as one year. APCO has stated over the past years that Safe-T-Poxy is good for at least 2 years and so we have always passed this information on to our builders. However, in our recent discussion with an APCO representative, they have changed their policy about the before stated 2 years of use. We were informed that storage conditions are a major consideration in setting a shelf life for any petrochemical product. They say that the worst case situation has to be considered the norm. This is why APCO has set the recommended shelf life for Safe-T-Poxy at one year. They also say that if you have kept your Safe-T-Poxy at near room temperature (APCO recommends between 50 degrees and 90 degrees F, but as close to 80 degrees as possible) you may be able to use it longer than one year, but you will have to watch for settling and crystallization of the epoxy in the bottle and do scratch tests as described in the plans after each layup. By the way, APCO does say that the shelf life limitation of one year is really only on the hardener (Part B) as it is most sensitive. It seems the resin itself is good for about 3 years. Also, APCO has informed us that leaving epoxy bottles opened can reduce the shelf life, and in the case of the hardener, to even under one year. Always put the lids tightly on the bottles when you are through using it.

For those of you whose hardener is over one year old or is approaching this age, pay very close attention to the following instructions and guidelines from APCO.

After the hardener has reached the end of its stated one year shelf life, discontinue using it and examine it carefully. If it shows no signs of sediment or crystallization, it can be used for making micro or flox and for doing layups over fillet areas. However, APCO informs us that it is NOT to be used to make parts (i.e. wings, flaps) or on anything structural (i.e. bonding the wings to the fuselage, bonding the tail to the forward fuselage). To make parts or to do any structural work, you do not have to buy new resin (Part A), but you must get new hardener (Part B) if the hardener you have is over one year old. The hardener can be ordered by itself directly from Aircraft Spruce. Also, if the hardener is over one year old and has sediment or crystallization in it, APCO says it is not to be used for ANYTHING. However, this rule of non-use does not apply if your hardener is LESS than one year old, because it can be heat-cycled. Details on this follow later in the article.

Are you still paying very close attention? Good! Because we are going to tell you how to determine the date of manufacture of your epoxy. On the bottom of each bottle of resin and hardener is a little white sticker with a letter and some numbers on it. The first letter represents the month, the second digit represents the year, and the remaining numbers are APCO's control code. Example: H3 602. The letter "H" is the eighth letter of the alphabet and so indicates that the contents of the bottle were made during August, the eighth month of the year. The number "3" indicates the year 1983. The numbers "602" are APCO's control code. So, you have

a bottle of epoxy that was manufactured in August, 1983, and its stipulated 1 year shelf life ends the last day of August, 1984. For those of you with the pails of epoxy, the date of manufacture is printed in plain language on a big sticker on the side of the pail.

Don't panic and start tearing parts off your airplane if they were made or installed using hardener that was over 1 year old. APCO says in all probability, as long as the resin was stored in controlled climate and did not exhibit any of the aforementioned problems, and all scratch tests were positive, you don't have to worry. If, after you completed a major part of the airplane, you noticed sediment in the bottom of your resin bottles, call us and talk to us about it and we will give you further instructions. (Leg-Air Corporation, telephone 530/799-1207). Darkened hardener is not a concern unless there is sediment in the bottom of the bottle.

As stated earlier, if your hardener is **UNDER** 1 year old and has sediment or crystallization in it, then it can be re-emulsified, or "heat cycled" as we call it. This process should get rid of the sediment, etc. and return you hardener to normal. If the sediment, etc., is still present after this process, you can repeat the process one more time. If, however, the sediment is still present after the second time, do not use the hardener and call us. (Leg-Air number above.) Here's how to do it:

1. Take a pot large enough to hold a container of hardener.
2. Take a **tightly sealed** container of hardener and put it in the pot.

3. Fill the pot with enough water to cover the level of hardener in the container. Remove the container of hardener.

4. Heat the pot of water to just before boiling. Remove from heat. Let stand for 2 minutes.

5. Put the **tightly sealed** container of hardener into the pot of water. Let cool to room temperature. Shake the bottle of hardener every 1/2 hour or at least twice while cooling to room temperature.

WARNING! NEVER PUT THE HARDENER BOTTLE INTO THE PAN WHEN IT IS HEATING ON THE STOVE AND NEVER PUT THE HARDENER OR RESIN IN ANY DIRECT HEAT BY THEMSELVES. THIS COULD RESULT IN AN UNSAFE SITUATION.

6. Remove the container of hardener from the pot of water. The appearance of the hardener should be even or consistent throughout.

If you still have sediment or crystallization, repeat the above entire process one more time. If the sediment or crystallization is still present after the second time, don't use the hardener and call us.

The above heat cycling method is directed specifically at the hardener, because you should never see any sediment or crystallization in the resin. If you do, do not use it and do not heat cycle it. Call either APCO or Leg-Air. You can reach APCO at (213) 322-8050 and ask for customer service. If you have any questions whatsoever on any of the information in this article, please do not hesitate to contact us.

Technical Tips

HOMEMADE VAPOR DEGREASER

From Bob Caravas, Technical Counselor #1214, San Carlos, California.

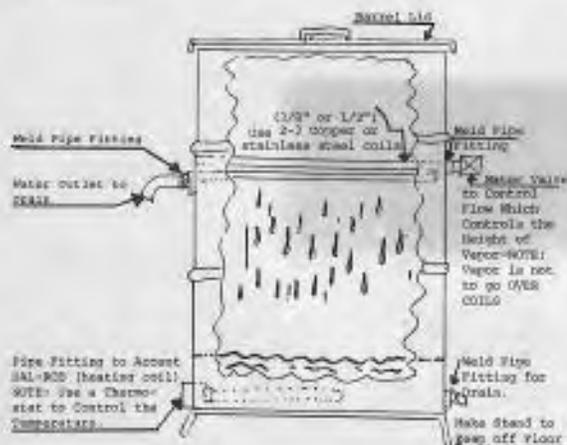
This is a homemade Vapor Degreaser, made from a steel drum or fabricated into any shape, preferably out of stainless steel. It doesn't have to be a drum.

Vapor degreasing fluid (trichloroethane) is used, which boils at approximately 160 degrees F. It goes up into a vapor next to the water coils and condenses. It falls back down to be heated again in a continuous cycle.

Parts to be degreased are hung in this vapor and are washed clean - simple! Works great for prepping parts to be alodined or painted - or just general cleaning. Works great!

NOTE: Control vapor height with water control valve - keep them cold enough so they do not let vapor go past the water coils! Also, use good ventilation in this area. GOOD LUCK!

P.S. Trichloroethane can be purchased under the trade name of Blaco-Thane

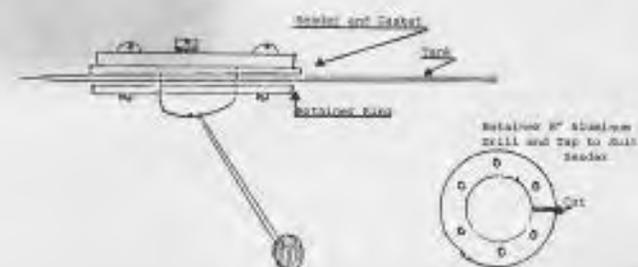


SOLVING A FUEL TANK PROBLEM

From Nick O. Seraphinoff, Technical Counselor #1303, Warren, Michigan.

Reading Tony Bingellis' article in the December 1986 SPORT AVIATION on how to build a fuel tank reminded me of a fuel tank problem that I had and solved for our Volmer Amphibian back in 1965.

I purchased two wing tanks to install in our bird that had no provision for electric fuel sending units. The tanks were used and I didn't care to weld on them. To solve the problem, I used the following method that might be passed on to others. I cut rings out of 1/8 inch thick aluminum the same as though I was to weld on the top surface of the tanks. After drilling and tapping the holes to receive the sending unit, I cut the ring between two holes so that the ring could be twisted into the tank through the holes in the tank that I made only large enough to allow the cork unit to enter. Then proceeded to string all the parts on a piece of wire through two of the screw holes to hold them in place until I had the screws started. So you end up with the retainer ring inside the tank. No warpage to worry about and no leak. I liked this method so well that I used it when I built the tank for my Thorpe T-18. This method could also be used to fasten a filler flange to any tank.



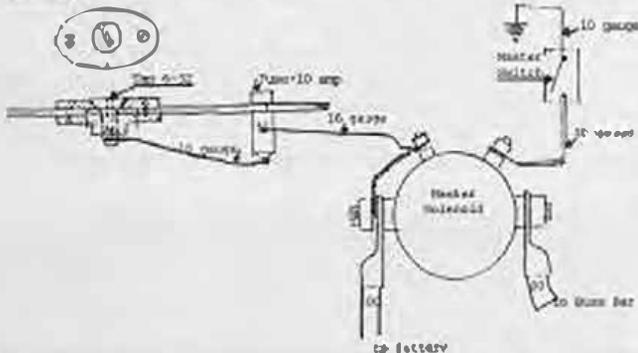
EXTERNAL CHARGING ATTACHPOINT

From Richard H. Kurzenberger, Technical Counselor #0937, Horseheads, New York.

Here's a suggestion for the EAA Technical Counselor News. The first start up for a homebuilt or restoration usually requires quite a bit of cranking, so that the battery needs to be recharged. This recharging can run into quite a bit of doing, sometimes requiring removal of panels, seats or — depending upon the location of the battery — the battery box cover, etc., etc.

In my latest project, I installed a small homemade exterior attach point for a battery charger. It requires a simple insulator thru the skin at an easily accessible attach point on the outside. I made my own insulator out of some fiber block so that it would be almost flush on the outside.

In aircraft equipped with alternators, the master solenoid control terminal is wired direct to the hot side of the battery, and the master switch cuts the ground connected to the other terminal. A 16 gauge wire is run from the hot terminal to a fuse block, then from there another 16 gauge wire is run to a screw, drilled and tapped 6-32. Thus it will receive the supply terminal inside, it will be flush outside, and when it is required to charge, a screw can be inserted outside so the charger can be attached. By installing this "goody", charging the battery can be done with all other equipment off. See sketch.



EAA/AVCO LYCOMING SAFETY CONTEST DEADLINE APPROACHES

If you have contributed to improving the safety of flying, you may be eligible to win a brand new Avco Lycoming O-235 engine.

For the fourth consecutive year, Avco Lycoming will provide an O-235 engine to the winner of the EAA/Avco Lycoming Safety Contest. The contest recognizes new designs, design changes, installation improvements or any ideas that lead to safer flying. All EAA members are eligible to enter.

"We're looking for ways to improve flying safety and we encourage all EAA members to submit their ideas for consideration," say EAA founder and President Paul Poberezny. "One of our organization's primary interests has always been safety in aviation. This is just one of the ways we encourage safer flying while recognizing the safety accomplishments of our members at the same time. Through the generosity of Avco Lycoming, we will again be able to present the O-235 engine to this year's contest winner."

The contest's initial winner in 1984 was Richard Brown for his water fuel detection test. Fred Caley was awarded the top prize the following year for his efforts over the past decade as Safety Chairman of EAA's International Aerobatic Club (IAC). Last year, Boris Popov and his firm, BRS, Inc., received the O-235 engine for the production and marketing of a ballistic recovery parachute for ultralight and amateur built aircraft.

We're looking for something that's currently in use and operational. All entries will be evaluated by a qualified panel of judges to ensure the most deserving entry receives the Avco Lycoming engine. The award will be presented during this summer's 35th annual EAA Fly-In Convention, which is set for July 31-August 7.

The entry deadline for this year's contest is July 1, 1987. Entry forms and complete contest details are available from Ann Ruby at EAA Headquarters, Wittman Field, Oshkosh, WI 54903-3065 or call 414/426-4800.



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