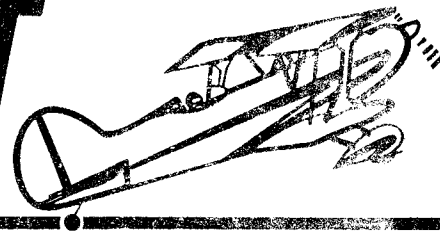
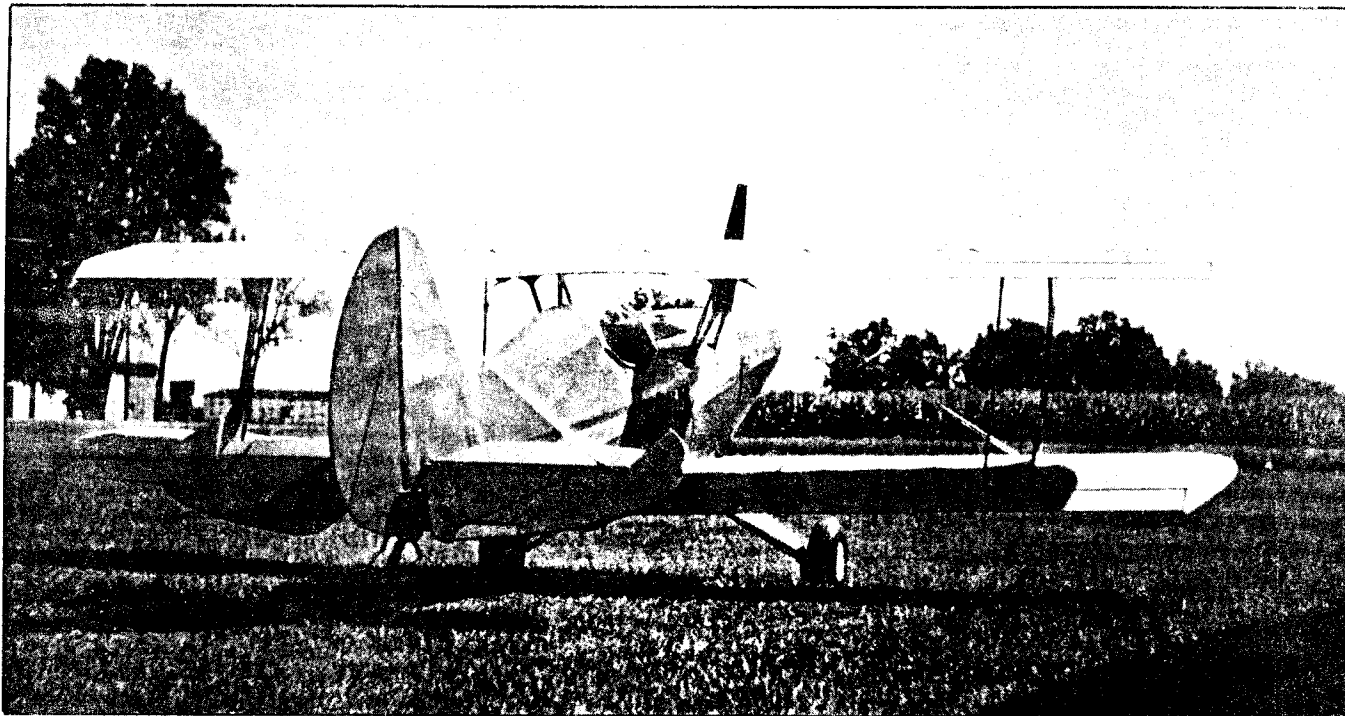


# ACRO SPORT Newsletter



NO. 19

MARCH 1987



## LARRY CORBIN'S MODIFIED ACRO SPORT I

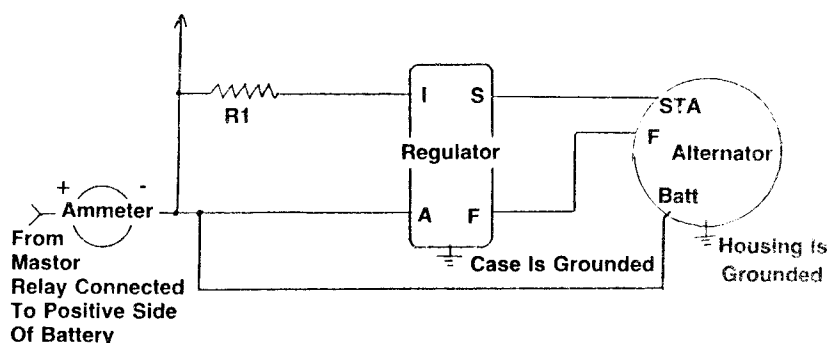
Larry Corbin, Fort Wayne, Indiana, has extensively modified an Acro Sport I for his own personal requirements. The Acro Sport I is, of course, basically designed as an aerobtic aircraft, for both upright and inverted flight. Larry's aircraft is primarily for sport flying, and the ultimate in aerobatic performance is not important to him. As he says, "I love biplanes and open cockpit flying. The aircraft was initially a little heavy due to an electrical system, and the fact that I weighed about 40 lbs. more than the "average" pilot. I don't mind hand propping my 65 HP Fly Baby, but I hesitate at hand propping the Acro Sport, and I also felt that an electrical system would help with the radios required at the local field. The original Prestolite alternator was shot, and I found a 35 amp unit used in Ford Escorts. With a rebuilt alternator, core charge, solid state regulator and sales tax it totalled less than \$50 and is available everywhere.

"The alternator comes with either a 'poly V' pulley or a standard 'V' pulley. The standard 'V' pulley uses the same 13/32 inch belt as the pulley on the Lycoming. The pulley on the Lycoming is larger than the engine pulley on the

Escort, but the Escort turns faster than the Lycoming, so it works out fine. The Escort does turn the other way, however. That doesn't make any difference electrically, but the fan blades will not pump air as efficiently. Normal loads

should not be a problem, but running it near its rated amperage may cause overheating. Finally, solid state regulators are so much more sensitive to heat than electro-mechanical relay types are, so either it should not be

### To Fuse/Distribution Panel



#### Notes:

1. R1 is 500 OHMS ½ watt for solid state regulators.
2. R1 is 15 OHMS 1 watt for relay type regulators.
3. An L.E.D. type warning light can be put in series with R1 if a solid state regulator is used. The minus side of the L.E.D. must be toward the regulator.
4. An incandescent type warning light can be put in parallel with R1 if a relay type regulator is used.

CONNECTIONS FOR A FORD ESCORT ALTERNATOR

mounted in the engine compartment or should have a duct blowing cooling air on them.

"I decided to increase the wing area by increasing the chord from 36 inches to 1 meter. The span was also increased slightly, but this was mostly due to using laminated wood wing tip bows. This is, of course, a major reduction in aerobatic capability, since both the red lines and maneuvering speeds have to be reduced.

The other really major concession of aerobatic capability was made in the way the wings were rigged. With the angle of incidence at the specified 1-1/2 degrees, the plane flew very nose high. In fact, the top longerons flew at over 2 degrees up. This is not surprising considering the lift curve of the M-6 as compared to say a Clark Y. I can see how this makes entry into a slow roll nicer, but I really do like to see over the cowl. The other problem with the rigging is that both wings having the same angle of incidence, the struts and wires cause the bottom wing to stall first, which causes the nose to pitch up at the stall. It is nice for snap rolls, but disconcerting to us 'Sunday afternoon' types. Unfortunately, I could not find any reference material on how to calculate how much more incidence to put in the top wing to make it stall first. So, based on the lift curve, and observations of how it had flown, I estimated a 1/2 degree difference. Based on the mushy stall I get now, 1/2 degree may be more than enough, but I am very happy with the overall results. I ended up with 3 degrees on the top wing, and 2-1/2 degrees on the bottom. The top longerons now fly almost level, as close as I can measure, and I can see over the nose. Obviously this rigging will work against you when inverted, but then, I have a float bowl carburetor anyway. Equally obvious is the fact that any serious aerobatic pilot would not like any of the changes I have described to this point, but any machine is a set of compromises, and I like this new compromise better than the old one. The rest of the changes I describe won't hurt the aerobatic performance and some may help a little.

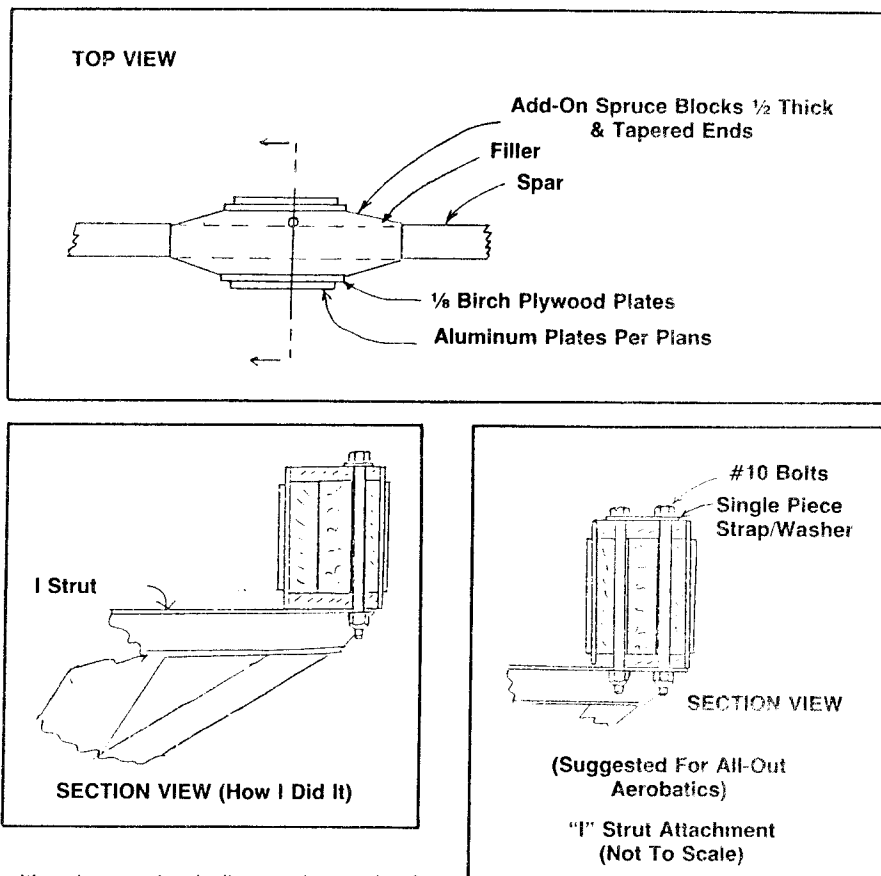
"I used no nails in the structure, and certainly used no staples. Stapling is such a horrible thing to do to a good piece of wood. I made a fixture to assemble the ribs with built in clamps made from stove bolts and blocks of wood. I could only make enough parts for one rib in a given evening, anyway, so tying up the fixture overnight was immaterial, and I could actually do the assembly with clamps quicker than with nails. Since I had the room, and the spruce was available, I made the top wing in one piece instead of three. This involved redesigning the cabane fittings, but it eliminated all alignment problems associated with wrestling with

three pieces.

"A plywood leading edge was used instead of aluminum. On both my Fly Baby and Citabria, the nails holding the aluminum worked loose and even pushed out through the fabric on the Citabria. Also, the leading edges wrinkled in the summer sun. The only precaution is that the wing has to be aligned perfectly before the plywood is applied, since it won't twist much afterwards!

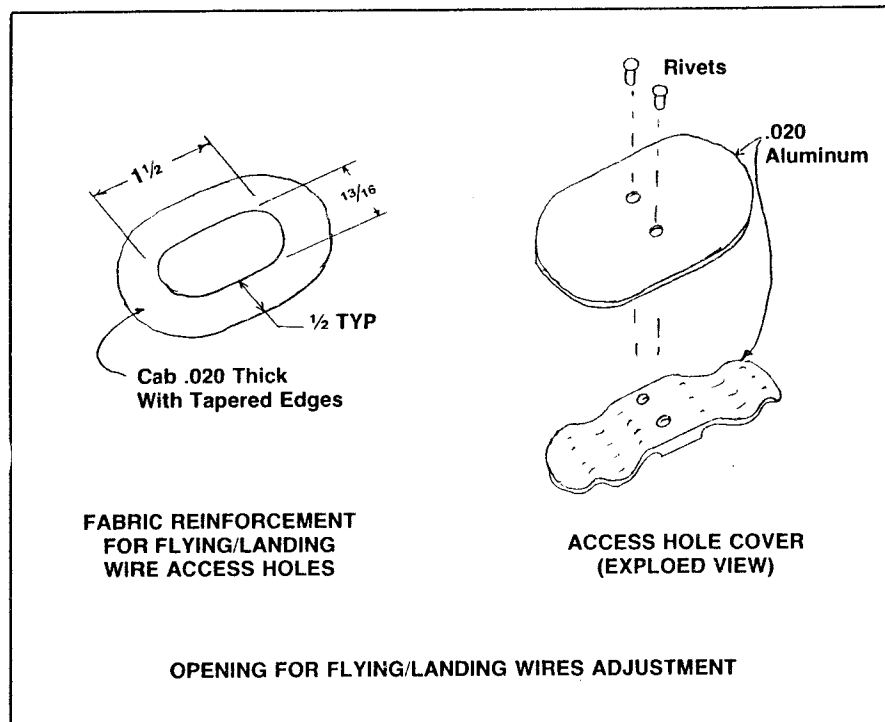
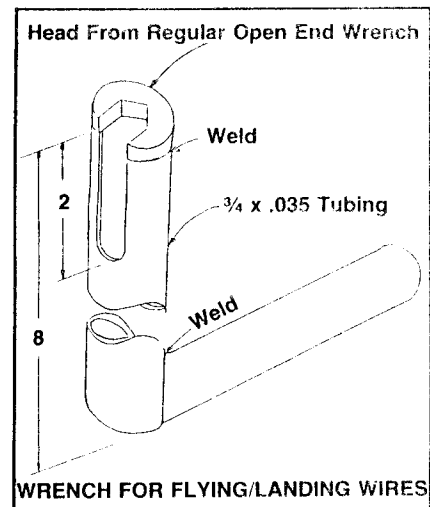
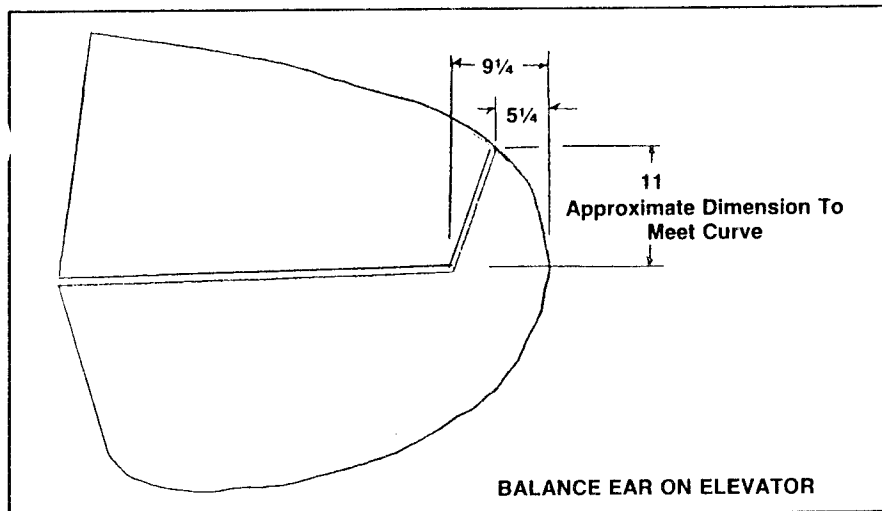
The gaps between the ribs and spars that were needed for assembly were filled with Hughes FPL-16 glue mixed

block right next to the spar, thus completely maintaining spar continuity. There is another big advantage. Even with a good drill press, a slightly dull or poorly sharpened drill can lead off and a crooked hole in the spar is serious trouble. But the hole can be drilled in the spar along with one of the inter-rib fillers, the hole was drilled through the filler, the other filler was glued on, etc. I used the same technique on the drag wire filler blocks. I calculated the angles, set the blocks up in a drill press, carefully drilled the holes and then



with glass microballoons instead of using wooden sticks. The putty was worked in one side until it came out the other. This is actually quicker than cutting sticks; it gives more complete contact between surfaces, and avoids stress on the cap strips that can happen if you force too thick a stick into the gap. Everytime I glued something, I used leftover glue to make the putty and did a few more ribs. A drawing is enclosed which shows how I put the holes for the bolts that hold the 'I' struts in place. I simply have to question the wisdom of drilling a vertical hole through a spar at its most highly stressed point. True, the 'I' strut has to match the filler block straight underneath the spar to avoid generating a twisting, off center load on the spar, however, the bolt does not carry any flight loads, it just keeps the 'I' spar in place. The exception to this is the bolt on the lower rear spar, which will be loaded in tension during inverted flight only. So I drilled the bolt hole in a

glued the blocks to the spar. The pre-drilled hole then served as a guide to drill through the spar. One thing I noticed while flying the original was a slight pitch oscillation. I felt that part of this might be due to the flexibility of the leading edge of the horizontal stabilizer. Also, I had read that the carry through tube on some Pitts Specials had been cracking, and that the plans for the Acro Sport were going to be changed to add a brace strut to the horizontal stabilizer. Therefore I added a brace strut to this plane. Another possible source of the pitch oscillation might have been some defect in the trim/balance tab system. Besides, it seemed overly complicated. Thus, I retained the tab on the right elevator and activated it with a normal push-pull cable and eliminated the tab on the left side. Then, I added balance ears to the end of the elevator. I don't know if these ears will lighten the stick



force enough for aerobatic pilots, but the elevators have a very nice feel to them in the flight envelope I have used so far. The elevator to horizontal stabilizer and the rudder to vertical stabilizer gaps were sealed with fabric, since I had found that to be beneficial on other aircraft. I cannot tell how much difference that makes here, since I had made so many other changes at the same time. I put a small baggage compartment where the auxiliary tank was, and eliminated the rear baggage compartment.

"One of the sketches enclosed shows the wrench I had made to tighten the jam nuts on the flying/landing wires. In use, a deep 1/4 inch drive socket is used through the center of the tube to grab the second nut. The advantage of this wrench is that it minimizes the size of the access hole required to an oblong hole of only 13/16th x 1-1/2 inches. Then, a small aluminum cover was fabricated as shown on the same sketch. I hope this information is useful!

Larry Corbin

**PUBLISHER'S COMMENTS:** I am sure that Larry Corbin has a nice airplane here, and I want to congratulate him on getting the airplane flying again. We do not recommend any changes be made to the Acro Sport as it was originally designed and flown. I guess you could call his aircraft a "Corbin Sport" due to the many changes. First of all, we don't generally recommend the use of electrical systems in aircraft that are designed for sport flying and aerobatics due to the degraded performance with the added weight. The Acro Sport I is capable of carrying pilots of up to 260 lbs. weight and 6'5" or even taller with no problems. We have heard of no complaints of inadequate wing area for the Acro Sport I. The Acro Sport, as its name implies, is a dual purpose aircraft designed for both sport flying and aerobatic flight. It is assumed that the average person will want to engage in in-

verted flight, and it has been found through extensive research on Pitts Special aircraft that the 1-1/2 degrees incidence for upper and lower wing is the best solution. The problem with a plywood leading edge is that when you do recover, it is difficult to take it off to see the structure for the spar. It is also not necessary to put strips of wood between the ribs and spars when gluing them together, on the 3 piece upper wing, as the usual procedure is for one set of plates not to be added to either the root or "I" strut plates before the ribs are attached.

"On the 'I' strut bolts through the spars, the current plans set up has also been used for Pitts and Christen aircraft for literally years, and has not been a problem of any type. We haven't had any pitch oscillations, and I have never heard of a problem with the leading edge of the horizontal stabilizer on our

aircraft. When some other aerobatic aircraft went to braces on the leading edge of the horizontal stabilizer, we added the same. The trim system, installed on the Acro Sport I, and actuated by a reliable and quality push-pull system works well. It might be added that tabs would have the same effect as the leading edge or aerodynamic balance that Larry added.

The flying and landing wires can be tightened by using a regular open end wrench and bending it after heating it 90 degrees. That and a socket wrench would be adequate for most airplanes.

Larry has found some interesting solutions on his "Corbin Sport". We want to congratulate Larry on the beautiful airplane, and thank him for his comments.

Ben Owen

## MANEUVERING SPEEDS

Maneuvering speeds of all aircraft can be determined by multiplying the stall speed times the square root of the ultimate load factor. Since this load factor is different upright from inverted, the maneuvering factor for inside and outside maneuvers does change.

In the normal category for factory aircraft, you can do stalls, lazy eights, chandelles and steep turns to 60 degrees. The normal positive G is 3.8 and negative G 1.52. Next category is utility that can do all of the normal maneuvers, plus spins, and steep turns past 60 degrees. The utility category positive G is 4.4 and negative G 1.76.

The next category is aerobatics, and

AIRCRAFT	G +	G -	V Stall	V Man Uprt	V Man Invtld
Acro Sport I	6	3	50	122	87
Super Acro Sport I	6	3	50	122	87
Acro Sport II	6	3	53	130	92
Pober Pixie	3.8	1.52	30	58	37
Cougar	4.4	1.76	46	96	61

For your convenience in doing calculation, the following is the column for square root:

Square root of 6 = 2.449  
 Square root of 3 = 1.732  
 Square root of 3.8 = 1.949  
 Square root of 1.52 = 1.233  
 Square root of 4.4 = 2.097  
 Square root of 1/76 = 1.327

in the aerobatic category, all maneuvers can be done, and the positive G max is 6, negative G is 3. Of course, this assumes a standard factory built aircraft, and the usual margin of safety is 1.5 times these. What this generally means is that aircraft are generally designed to be flown to that positive or negative G load, and they will not bend. Beyond that G load they will normally start to bend and take a permanent set up to 1-1/2 times their stated G loading, at which point they will break. If we were to apply these G loadings to the following aircraft, you would see a chart as follows:

The bottom line on maneuvering speed is that maneuvering speed is the maximum speed for full deflection of any controls. Full deflection of any controls at speeds in excess of this will overstress the aircraft. These would be recommended full deflection maneuver speeds for the above aircraft.

## BIPLANES FOREVER! !

The comparison of biplanes with monoplanes reveals some interesting features and tells us why they will probably be around for a very long time. What it boils down to is that the biplane is just the most efficient aircraft for some types of flying, and will be for many years to come. Some of the advantages follow:

### BIPLANES

- 1) Lighter wings, less moment of inertia.
- 2) Less span.
- 3) Less rudder due to less span.
- 4) Usually a shorter length.
- 5) Lighter wings for area of wings.
- 6) Higher drag.
- 7) Fixed gear.

In World War II, it was found that for a fighter aircraft, the fast pass — strike — fast breakaway was the order of the day. This may have mislead some de-

signers and aviation historians into thinking that the monoplane was a "better" airplane. The monoplane is a better airplane for this type of work, but the biplane has many advantages, particularly those in aerobatic flight, load carrying, etc. At the same speed with equal ailerons, the average biplane will **always** out roll the monoplane due to the

### RESULTS

- 1) Quicker response in roll, faster snap rolls.
- 2) Faster rolls (roll rate is a function of span and speed).
- 3) Less rudder drag.
- 4) Faster pitch response.
- 5) Faster climb.
- 6) Less speed build up in dives, easier to stay in an aerobatic box or area.
- 7) Higher drag, and most fixed gear aid in knife edge flight by adding more side area.

fact that roll rate is a function of speed and span. Since the biplane can have a shorter span, its roll rate will always exceed that of a monoplane.

## DRAG AND ANTI-DRAG WIRES

We all know the wires from McWhyte or our good friend Nick D'apuzzo (A. Wheels - P.O. Box 174, Ambler, PA 19002) are grade A and number one wires. However, if you are endeavoring to keep the cost of your airplane down, some alternatives are available. An example is the Pitts S1D, and on assembly call out -18 and -19 it shows a drag-anti-drag wire made of 4130 rod, 3/16 inch x 43 inches and another 3/16 inch x 47 inches. These are die cut by the builder using two nuts at each end, as a safety feature. We want to thank Chuck Gerow for bringing this item from the Pitts S1D to our attention. If you design your own wires, of course, the size of the minor diameter of the wire is very important for strength, and more than likely you will need larger size wire.

## PRESSING THE AILERON FITTING BEARINGS INTO 1/4 INCH ALUMINUM

The KP3 bearing has an outer diameter of .7774 inch to .7769 inch. We have calculated the interference fit should be from a -.0007 to a -.0021. The inside diameter of the arm hole then should be from .7753 inch to .7762 inch, with a midrange of .7757 inch to .7758 inch. Of course, due to the accuracy required here, you are going to have to go to a machine shop and either have them do it or borrow a reamer to do the arm. However, you can do this using a good drill press. Be sure to use a holder to drill and ream the arm. It is best to use an arbor press, and a suitable installing tool to press the outer ring into the arm. You can chill the bearing and heat the arm prior to installation, which should help. If you are doing business with a local machine shop you are unfamiliar with, we suggest you not mention aircraft when asking for their assistance. You are looking for about a .002 inch interference fit to slightly less. When drilling, you should start with the small drill and work up to your large drill, and finally the reamer. Thanks to Chuck Gerow and to EAA Mechanic, Bauken Noack and engineer Harry Zeisloft for information.

## MISCELLANEOUS SHOP NOTES

When installing the plywood on the leading edge of the ailerons, we suggest you clamp them down to a flat surface. In spite of the openings in the D tube, the D tube stiffener will not enable the aileron to be twisted after it is glued tight.

One of the mechanics in our shop sprays all 4130 on the marked side with gray lacquer, and finds that it is very easy to do layout on the metal in pencil, also if all 4130 is sprayed when you receive it, all gray metal in the shop can't be confused with other metal in the shop, as it always should be 4130. Don't spray over the numbers on the back so you can tell what you've got.

A slow speed metal saw is a good shop tool, and they can be found quite cheaply in many farm equipment stores. You can set them up vertically and put a small table on them to do all of your fittings. When building fittings, it is suggested that you match one to all and use one as the master to drill all the same with a 1/8 inch pilot hole and then final drill. Use one as a template, and then you won't have to mix and match as you take the fittings off and on several times while constructing the wing. This is called "matched hole tooling".

It is suggested that you drill the spars before building the wing, as it is easier to hold them flat on the drill press table and perform this operation with one person.

You should make the incidence jig before you start the rib so that you will have plans to work from, before the rib drawing is glued to the jig.

It is suggested that you use the Piper lift fork on the center sections as the plans show if you aren't sure of your ability to adjust the center section before final welding.

## WOOD PROBLEMS

If you have wood that doesn't really meet the mil spec, you can return it to the supplier. About all you can do with larger pieces that have defects is to cut them up the make good, smaller parts. **Don't use bad stock!** You can get mil spec copies for both aircraft spruce and aircraft plywood free from EAA Information Services at (414) 426-4821.

## ACRO SPORT II

Build the landing gear cabane as shown on sheet 5.0 zone C-1. Note the bottom leg is inboard slightly to clear the fittings for the landing gear. Thanks for the above two tips to Jim Riley of Connecticut.

## NOSE BOWL CLEARANCE TIP

I was going to call this "spinner clearance", but in checking the aircraft, I see that many also have the clearance problems inside the engine to the nose

bowl. Looking at some clearances on museum aircraft, I come up with the following:

AIRCRAFT	CLEARANCE SPINNER TO NOSE BOWL	REMARKS
Pitts S2 Prototype	1 1/2"	*Can't get 1 finger between the starter ring and nosebowl inside.
Spinks Acromaster	7/8"	*This engine is an IO-540 and is very tight inside the cowl.
Starduster Too	5/8"	*Lots of finger room inside - two finger clearance from the ring to the nose bowl.

We recommend when you are setting up your engine and nose bowl that you remember that the clearance from the starter ring, if one is used, to the nose

bowl and the clearance from the spinner to the nose bowl should be approximately equal. Thanks for this tip to Tony Hohenwalde of Colorado.

## DZUS GROMMET FITTING ON THE ACRO SPORT II COWL

This is from the Aircraft Spruce catalog showing Dzus fasteners and the option for the Acro Sport II cowl would be about 5-7 of the Grommet GA-4-250, the Spring S4-200 and the Dzus fas-

tener A4-25. The head is the oval head type, and of course, for the installation of the metal Grommets and the Dzus fastener, you will need the installing tool that you can rent.

Dimension	Measurement	Part Number
N	.025"	Grommet GA4-250
P	.025	Alum Side Cowl
Q	.025	Alum Bottom Cowl
"	.032	Alum Channel
H	.200	Spring S4-200
SUB TOTAL	.307"	
- Deflection	.045	
TOTAL	.262	
L	.250	Dzus A4-25
Permanent Spring Deflection	.012 (1/4 of total)	

The above is from a hint supplied by Tony Hohenwalde.

## PLANS AVAILABLE FROM ACRO SPORT, INC.

P.O. Box 462, Hales Corners, WI  
53130, telephone (414) 529-2609

PLANS FOR	PRICE	SHEETS
Acro Sport I	\$60.00 post paid	24
Super Acro Sport (with wing supplement)	\$75.00* post paid	26
Acro Sport II	\$85.00 post paid	23
Pober Jr. Ace - (Corben)	\$85.00 post paid	37
Pober Super Ace - (Corben)	\$85.00 post paid	17
Cougar	\$60.00 post paid	14
Pober Pixie	\$60.00 post paid	16

Information packs for any of the above are available for \$5.00, postage paid.

\*This includes the plans for the Acro Sport I at \$60.00, plus the wing supplement for \$15.00. This may be used on the Acro Sport I **ONLY!**

ALSO AVAILABLE from EAA or Acro Sport, Inc.: The Book, "Techniques of Aircraft Building" - \$12.00 post paid, and the Acro Sport Newsletter, 4 issues per year, \$12.00 per year.

## EDITORIAL BY PAUL H. POBEREZY

With the coming of spring, we will see many more homebuilts in the air, and with the aircraft industry building very few single engine aircraft, interest in homebuilding continues to grow. FAA N# registrations for experimental amateur built aircraft continue to increase with the passing of each year. Interest in the Pober Corben Junior Ace, a modernized version of the two place, side by side Corben of the mid-late 30's, continues to grow, with a number of them already started. In my workshop this winter I was able to design and build up the turtle deck, complete the two side doors, and install an 85 HP continental. The single place Pober Corben Super Ace also is taking

shape, and it is on the landing gear now, using 6.00 X 6 Cleveland wheels and brakes. The tailgroup is installed and wings are covered and ready for installation. As we all know in homebuilding, the big pieces seem to go quite rapidly — it is the detailed work, rudder pedals, control systems, etc., that seems to take the greatest amount of time.

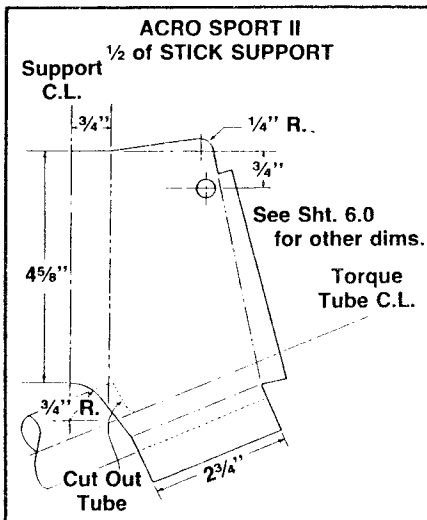
Those who have seen both of the prototypes under construction are very pleased. The airplanes will be on display at EAA Oshkosh workshops during this year's convention. Bob Stagner, (1911 Fernwood, Poplar Bluff, MO 63901, (314) 686-1669), who is the 1987 Workshop Chairman, visited us recently in laying out plans for the various workshops. As there are many and varied talents needed from building

wing ribs, welding, helping on fuselages and wings, he would be as pleased as I in any of you contacting him and offering a hand during the convention.

In the Stits and Acro Sport tent, we will again have aircraft covering demonstrations; an Acro II uncovered on display, the Pober Corben Jr. Ace and Super Ace, and an area set up with seating for mini-forums for discussions on building these aircraft. I am sure this educational feature of the workshop area will be very welcome by homebuilders. Send in photos of your project under construction or completed, or any questions you may have to Ben Owen, Executive Director of Information Services, EAA, Wittman Field, Oshkosh, WI 54903-3086.

## ACRO SPORT II STICK SUPPORT

This is the stick support again, for those of you who may have missed it in a previous issue.



## JANE'S ALL THE WORLD'S AIRCRAFT

JANES ALL THE WORLD'S AIRCRAFT publishes information on all Acro Sport aircraft every year. Last year, the following pictures were published:

ACRO SPORT II - Jack Elenbaas of Holland, Michigan  
 PIXIE - Jose Barcellos of Puerto Alegre  
 COUGAR - Charles Goodrich of Detroit, Michigan  
 ACRO SPORT I - Mosely High School, Panama City, Florida. Frank Smith instructor.  
 SUPER ACRO SPORT - prototype in knife edge flight, photographed by Dick Stouffer  
 CORBEN JUNIOR ACE - Wilton Weser of DesPlaines, Illinois

For the 1987-88 JANE'S ALL THE WORLD'S AIRCRAFT, we have submitted the following pictures:

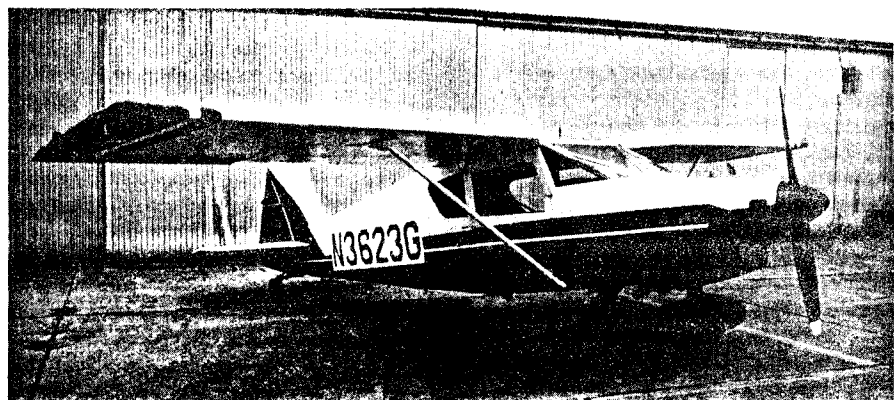
PIXIE - Mario Chabot of Saint-Mondville, Quebec, Canada.  
 COUGAR - Ray Wilkes of Ottumwa, Iowa  
 ACRO SPORT II - Jim Olson of Arcadia, California  
 ACRO SPORT I - Doug Bell of Cadillac, Michigan (Best Acro Sport I at Oshkosh 83 and 86)  
 SUPER ACRO SPORT - Fred Caravetta of Coral Gables, Florida  
 CORBEN JR. ACE - Again by Wilton Weser of DesPlaines, Illinois

Just another good reason to keep sending pictures of your aircraft in! You never know where they are going to be used. JANE'S ALL THE WORLD'S AIRCRAFT is a world wide publication of international reputation.

## RAY WILKES' COUGAR PROJECT

Ray S. Wilkes, 11 Schwartz Drive, Ottumwa, IA 52501 sent in this photo of his Nesmith Cougar. "I got the enclosed print from some slides I took just after installing a fiberglass "Rattray" cowl (August 1985). I really like my Cougar! I've done lots of rework, but the original builder was in California, where I bought it from the third or fourth owner in 1972. It was built in 1962."

"Another Cougar is nearly completed by Harold Weber, 858 Union St., Unionville, MO 63565."



## EXPERIMENTAL DEVELOPMENT AND SUPPLY, INC.

WE HAVE RECENTLY OPENED IN THE HOUSTON AREA, and are catering to the needs of the homebuilder. We

are presently stocking most sizes of steel and aluminum tubing, steel and aluminum sheets, AN hardware, wood, new and used instruments, electrical supplies, tires, tubes, wheels and many other parts. When we are fully stocked,

we will have everything except foam and fiberglass.

Ed Everett, President  
 Experimental Development & Supply, Inc.

## DULL TOOLS

I learned (again, the hard way) that you can't ignore dull tools. One of the most common ways that people are injured in shops is when someone walks into the shop and speaks to you when you are working and you answer them before you put the tool down. Don't blame them, put the tool down first, because this is a very common way for people to get injured. While cutting a wing sling with a dull carpenter knife, the knife slipped and got my left thumb — seven stitches! Maybe it is time to review some safety basics:

Don't drop things on the floor and let them lie. . . they will trip you up!

Wear your eyeglasses or your face shield.

Always use a drill hold down when drilling parts.

Don't force small parts on the grinder/polisher.

Use a wooden pusher when you are cutting with the table saws.

Use the dust mask when sanding and painting.

Don't rush work!

Try to remember this, fellows, I have learned recently that having to stop work for three weeks while you heal isn't very efficient. I could have done a lot of things slowly in that same period of time. Take care!

Ben Owen

## WING FITTINGS AND ESPECIALLY LANDING GEAR FITTINGS

The front and rear fitting holes should be in line. By sighting through the front hole fittings, the rear hole fittings should be in a direct line with the front holes. Otherwise, with movements, the fittings are twisting the bolts, and the bolts are putting an unequal stress on the fittings.

### CUSTOM FUEL TANK SERVICE

Have your fuel tank built to your custom specifications for approximately \$250.00 per tank. Builder is experienced in the construction of tanks for amateur built aircraft over several years. The weight of the tank is 8 lbs., 12 oz. Contact Benny Davis, Route #2, Corydon, IA 50060. Telephone (515) 872-2032.

Photograph of Benny's tank by Carl Schuppel, EAA Staff Photographer.

Jean Kinnaman — President

Ben Owen — Publisher

Ann Ruby — Editor

Mike Drucks — Art Director

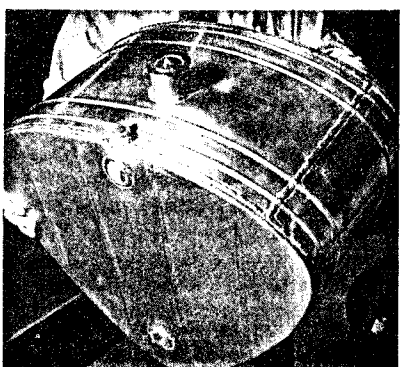
## HAND PROPPING

Thanks to Larry Harms, Acro Sport I pilot.

The light weight on aerobatic aircraft means no electric, no starter, no alternator and battery. It also means **hand propping**. There are no rules against hand propping, but the FAR 91.9 says "CARELESS OR RECKLESS OPERATION: No person may operate and aircraft in a careless or reckless manner so as to endanger the life or property of another."

The terms "careless" and "reckless" can be pretty much in the eye of the beholder. An FAA employee or fixed base operator who has never hand propped might think any hand propping is careless and reckless. The best way is to hand prop with a private pilot or better in the cockpit. If you are alone, however, you can hand prop while standing in back of the prop with one hand on the prop and one on the throttle. This "may" not be careless or reckless. A well known racing pilot has done this for years, and it can be a very safe operation. If you hand prop with a glider hitch at the rear of the aircraft and if you hand tie your glider hitch to a secure tie down cable tree or etc., start the engine and then climb in the cockpit and release the hitch, you would probably not be careless or reckless. If you hand prop without a tie down, or even after tying down and then go to the tail to untie, you might be considered in violation of 91.9. It is sort of up to the judgement of whoever is watching you. A glider tow hitch would appear to be the best solution. Many fixed base operators won't let their employees hand prop these days due to what they feel is a danger involved there.

"THE TECHNIQUES OF AIRCRAFT BUILDING" is an excellent reference, available from EAA for \$12.00, postage paid.



Tony's Acro II is nearing completion! Many of the technical comments and tips (including plans corrections) that you see in this newsletter are the result of conversations that Tony and I frequently have.

## FOR SALE

**SUPER ACRO SPORT** - Wag Aero pre-welded fuselage, landing gear, tail group and fuselage control kits, aluminum turtle deck, formers and stringers complete, cabane strut and center wing section with streamline control wires, ready to rig and drill. Wag-Aero wing kit assembled with leading and trailing edge drag wires and wing tips. Ailerons built, but need to build hinges, idler, bellcrank, pushrod assembly and I struts to complete airframe. Ready to cover. Have fiberglass wing tips, wheel pants and nose bowl. You will need covering material, smoke oil, fuel tanks, instruments and firewall forward. Call Paul Killman, 711 Charles, Aurora, IL 60506, telephone (312) 896-2845. Asking price is \$5,000.00.

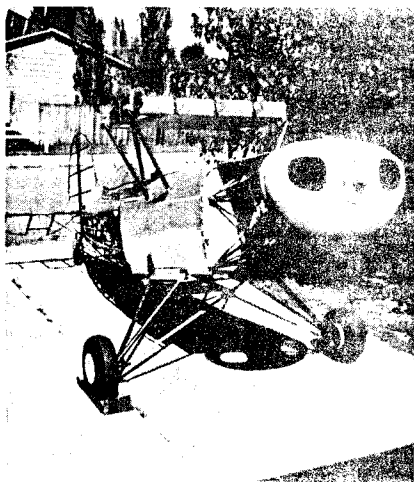
**ACRO SPORT II PROJECT** - 95% complete up to cover. Ready to cover. Flying wires included, instruments and cowl. Has Lycoming 360 of 180 HP from 180 Cherokee run out at 2100 hours. Wings are covered, has fabric for fuselage and all sheet metal. You need to cover the tail, fuselage, tank unassembled, \$10,000. Contact Frank Rosner, 1030 E. 161st Street, S. Holland, IL 60473, telephone (312) 339-6323.

**POBER PIXIE PROJECT WANTED** - Samuel Mucaria is looking for a partially completed Pober Pixie Project. Anyone with one for sale can call him at (714) 849-7510.

## RUDDER POST AND RUDDER FRONT SPAR MATCHUP

One of the most visible items on any aircraft is the matchup between the rudder post and the rudder front spar at the very top. This is very visible on the ground when people are walking around the aircraft. We suggest you work on this to get a good matchup here for aesthetic reasons.

## TONY HOHENWALDE'S ACRO SPORT II PROJECT





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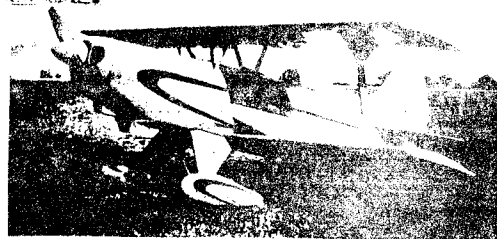
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