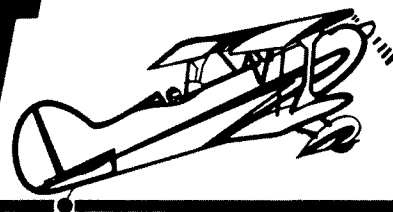


ACRO SPORT Newsletter



NO. 56

Printed by:TIMES PRINTING CO., INC.

WINTER 1996

Ready to Go ...

August 27, 1996

Hello there Brother Owen

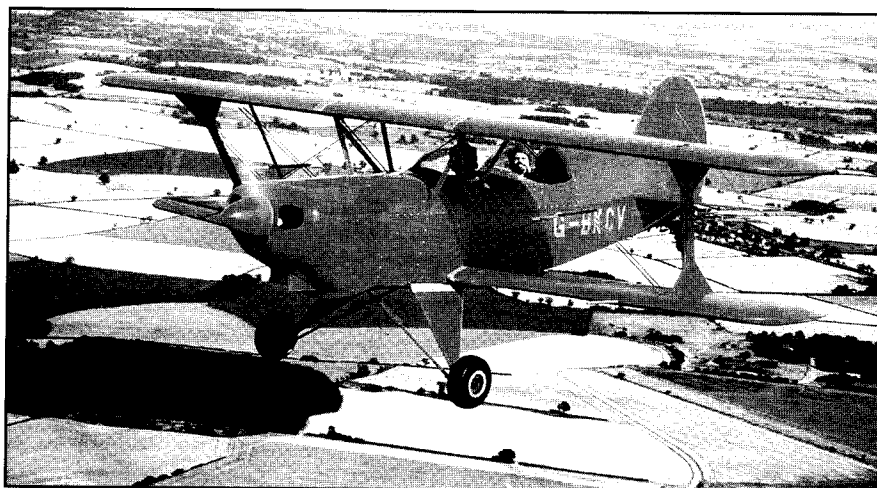
At long last, enclosed is a photo of my Acro II, N400GB. The fabric is Poly-Fiber P-103 finished in Poly-Tone colors of International Orange and Juneau White. Metal and fiberglass parts are in matching colors of Dupont Dulux enamel. Power is from a Lycoming O-320-D3G of 160 HP to which I have fitted a Bendix fuel injection system. It is not signed off yet due to a landing gear alignment problem which has yet to be rectified, but that should be done in the very near future. As always, thanks for all the help along the way. This project has taken about fourteen years, and has kept me out of the bars that entire time.

Take care and tell everyone "Howdy" for me. Thanks.

Dan Reed
1209 E. Republic Ave.
Salina, KS 67401



Dan Reed's beautiful reward for 14 years of effort!



Tim Jinks' G-BKCV photographed over the Leicestershire countryside by PFA

Photo by Ed Hicks

March 10, 1996

Dear Sirs,

I have recently purchased an Acro Sport II registered G-BKCV from original constructor, Mr. Mike Clark. I believe construction was commenced in 1982 and the original set of plans has a serial number of 430.

The aircraft was granted its permit to fly in 1990/91 and Mike flew her for around 80 hours during the last five years. I acquired her in June this year and have logged around 22 hours the last three months. She is a fine looking and performing aircraft carrying a Lycoming O-360, and is admired by all who see or fly in her, although her paintwork, the ill-fated Blue River Flexi-Gloss, has suffered somewhat. I intend to do something about this over the

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coming winter months.

The reason for writing is to see if you still publish 'Acro Sport News' or any other similar club newsletter; I have a faded copy from March 1986 in which the two place Acro Sport appears to be making some news. If it is still available and there are any clubs or groups I would be very grateful to know.

I look forward to hearing from you.
Yours faithfully,

Timothy Jinks
Holly Cottage
95 Main Road
Baxterly, Nr. Atherstone
Warwickshire
CV9 2LE, England

Footnote: We are desperate to fit a single or double canopy – (our weather); any advice on where to go for one?

Editor: Our Newsletter No. 53 had a good article on how to adapt a used Pitts canopy for use on the Acro II.

September 12, 1996

Dear Bill

I got a call today from Erik Edgren, 2714 Queens Avenue, Oskaloosa, IA 52517. He has an Acro Sport II and has been experimenting with stall strips. He uses balsa which is 3/4" on the flats, 18" long. He set the outboard edge of the stall strip 1" in from the inboard edge of the aileron gap on the leading edge of the upper wing. After some experimentation with this, he found that he could do a clean triple snap with these stall strips. This might be of interest to other Acro Sport II owners looking for a clean stall to snaps.

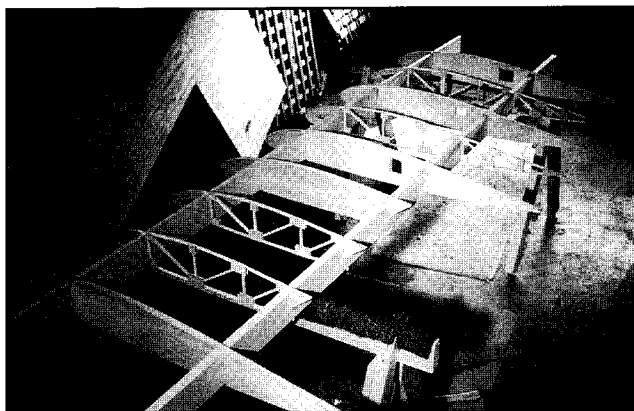
Ben Owen, Executive Director
EAA Information Services

February 15, 1996

Dear Bill:

I received my December issue of the Acro Sport Newsletter the other day and was surprised to see my letter included. Looking back only a few months ago, at how little I knew, makes me laugh today. The "education" aspect

**Scott Spencer's
Acro II wing with
Sidders boxed cut-
outs for push-pull
tube.**



of building is really growing on me. I owe a great deal of thanks to Neil Sidders and Ben Owen. They have responded to my questions, no matter how stupid they may have been. Neil especially provided great advice on the construction of my wings. I took his suggestion on boxing in the cut outs for the aileron push tubes in the spars and they turned out beautiful and clean looking. I've enclosed a picture of the wings, taken in December, showing the cut outs. I have also decided to use the Smith Miniplane type compression springs on the gear, 1.5mm plywood for the leading edges, cut my own drag/anti drag wires (1/4" 4130 rod using 1/4-28 threads), and I'm going to box in the Strut rib bays with 1/8" plywood.

I have found that the more you get involved in aviation related activities, the more information and assistance you can find. I joined one of the local squadrons of the Civil Air Patrol last November and met members of the Bessemer, AL, chapter of the EAA. They were so nice, I attended one of their meetings and joined their chapter. (I am also a member of Chapter 152, in Birmingham. Bessemer is part of the greater Birmingham metro area.) To make a long story short, I met two gentlemen, Ken Miller and Charlie Knight, who were also building Acro Sport II's. Ken and Charlie have their fuselages welded, but none of the woodwork

started. Ken offered to help me weld my airplane if I would help him with the wood portions. I'd say that is a pretty fair trade! (Ken has been welding 20 years. We are building all three Acro's in Ken's workshop. There is a fourth person contemplating the building of an Acro II with us. If we can get them all finished, we could almost have a "squadron" of Acro Sport II's right here in the Birmingham area. Ken, Charlie, and I are planning on attending Sun-n-Fun this year and look forward to the Forum. Ken and Charlie are talking about flying Charlie's Yak-52 down. Myself, I'll be flying the CAP's 172 with another CAP member, and EAA'er, that is building an RV-4.

I'll keep you updated on our progress and send photos of our modifications, changes, completion's etc.

Sincerely,
Scott Spencer
4429 Englewood Rd.
Helena, AL 35080-5022
(205) 620-4313

P.S. In answer to your question about Joe Spencer...Yes, Joe is my "family." He is my first cousin. I flew his Acro Sport II back in January. What a thrill!!! If you ever need motivation to get to work on your Acro Sport, just go find one and fly it. You'll only want to finish yours that much sooner!

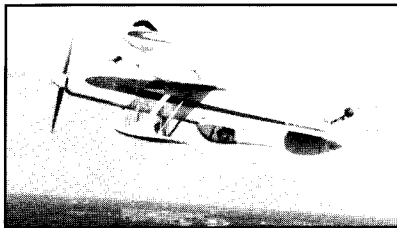
EDITORIAL/ by Bill Berrick, Editor

In a former life as an Air Force Hospital Commander one of my most important duties was to identify and groom people to take over my job. That is also becoming an important task in this life as an Editor.

I passed the big seven-O this year and entered what everyone considers the world of senior citizens. It is mostly a pleasant time of life, but it is also a time when I must consider the possibility of my own mor-

tality. This isn't to suggest that my health is poor, nor is it because I am about to test fly another homebuilt! We just need to be looking out for the future of the Newsletter.

There are some really good writers among our contributors, and probably a lot more among the readers. Please let me know if you might be interested in helping out and eventually taking over as editor. Isn't a paying job, but the association with Paul and Ben is a greatly rewarding learning experience and surely a satisfying one. Finally, the chance to hear from a lot of bright and interesting people makes it all worthwhile.



Tailsides In The Acro Sport II

by Don E. Baker

The tailslide is a good maneuver to learn and it will help polish your skills for other maneuvers. It is a little more sensitive to the accuracy of the vertical positioning, so working on it will improve hammerheads, vertical rolls, etc. It starts out just like a hammerhead and will need full throttle, good airspeed and enough altitude to insure that recovery can be safely accomplished. Even after you become an accomplished tailsider, it is probably best to begin the maneuver at no less than 1000 feet AGL, level flight. For the first ones, start the wings level relative to the horizon throughout the pull and into the vertical up line. The longer the vertical line the more impressive the maneuver will look from the ground, but a long up line is not really essential to the maneuver's success. Look alternately at each wing tip to be sure you are keeping everything exactly true during the pull to vertical.

You must stop the pull when the airplane is pointed straight up. This is hard to do in the ACRO II unless you have some sort of reference to go by. A sighting gauge attached to the I strut, which most competitors use, is probably the best. However, I put reference lines on my canopy for this purpose. They lend a great deal of consistency to vertical up lines in hammerheads, humpties and other maneuvers as well.

Another important visual reference for the tailslide is some sort of indicator of when forward motion has stopped and the slide has started. Because this is a power off tailslide, there is no propeller blast to keep the tail group functioning in the normal positive sense. There are many indicators available in a hammerhead to prompt you, but in a tailslide it is nearly impossible to tell when you have stopped forward motion. There are no bodily sensations to help you out either, but still, you need to know because all the controls reverse in a power off slide. The best indicator is a piece of yarn, tied in the center of one of the I struts. It works extremely well. It goes limp and immediately blows backward at the instant the airplane begins sliding.

After the vertical line has been established, but before the vertical speed drops to zero, smoothly and with medium speed, reduce the throttle to idle.

You should work the timing so that you coast upwards for a few seconds after the engine reaches 800 RPM to assure that it won't die during the slide. If it dies, it will stop turning almost immediately. A dead engine in the middle of a tailslide is a very tense situation at best!

Keep your eyes and that wing tip glued to a reference point on the horizon and correct for any rolling tendencies on the way up, when you decelerate, when you stop, and when you begin sliding backwards. The airplane will decelerate, when you stop, and when you begin sliding backwards. If the throttle is pulled too abruptly, the airplane will tend to roll slightly and alter the up line track. The airplane will decelerate very quickly without power, so be watching that yarn out of the corner of your eye, to know exactly the instant that you have stopped forward motion.

At that instant, it is imperative that you have a firm grip on the control stick and considerable pressure on both rudder pedals to keep the controls from slamming against their stops. At this point, the controls should be at, or very near neutral positions. When the slide begins, it is OK to just hold these control settings and ride the slide through. You get whatever has already been established in the up line. The better the up line, the better the slide. If the wings are level (correct rudder) it won't fall off to one side and the slide will accelerate backwards until the airplane flips either forward or backward, depending on several factors.

Do not worry about sliding too far, it is almost impossible to slide straight back and reach excessive speeds. Instead, you will likely be disappointed that it did not last very long and you'll want to try it again. The object is to have a good long backslide line.

Once the flip starts, you can't do much to control its outcome. Hold the controls tightly and it should flip over and pass through the horizon to nose down vertical. If it is a really good one it will continue to swing, pendulum style, up the other side until the nose reaches the other horizon. Continue holding neutral controls until it swings back and then establish a vertical down line. Add power and recover to level flight, as you

would from a hammerhead.

At the moment the slide begins, but before the flip, it is possible to finesse the controls to stretch the length of the slide. You can sort of "fly" it through the back slide. If the entry is not perfect, this will let you correct it, however, it is difficult to do and will require practice.

Practice, practice, practice... it's a dirty job hey, somebody has to do it!

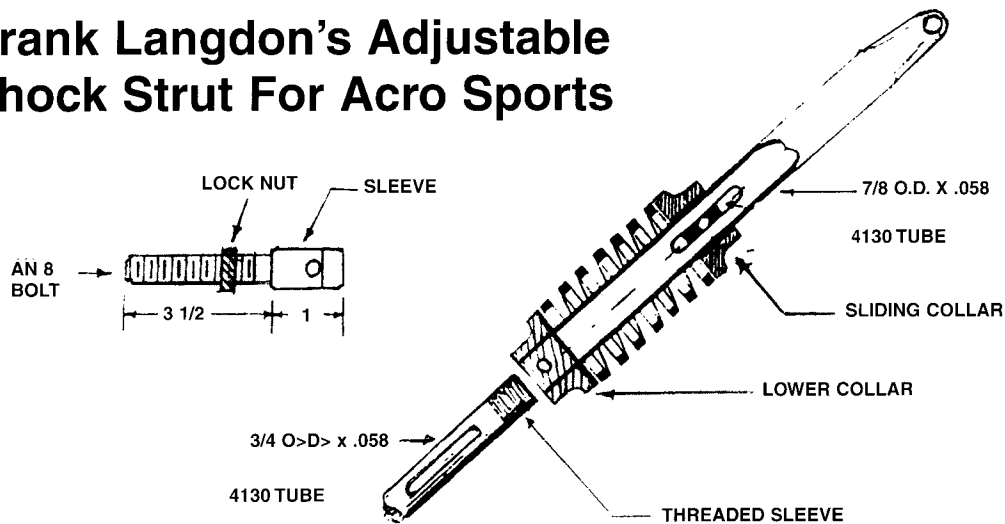
If you are watching the horizon and a slight roll develops (maybe you pulled the throttle too abruptly) the tendency is to correct instinctively with aileron. This is OK if the motion is still forward, but as you begin to slide you must consciously use opposite aileron to correct. Otherwise, the roll will seem to mysteriously worsen. Now you see the reason for the yarn indicator.. Also, when sliding backwards use the elevator and think "pull the tail up" and/or "push the tail under" to correct for pitch errors to keep the slide going as long as you can. In competition you must flip the specified direction. It can be controlled either by proper entry or by correct, but delicate, use of elevator. If you choose to not use the elevator for correction, then a slightly positive vertical line (a few degrees short of vertical) will help insure a wheels up flip. If you do use the elevator, then, pulling the stick will create a wheels down (upright) slide, whereas pushing the stick will create a wheels up (inverted) slide.

I have found, in a really good slide, that it requires more strength than I have in one arm to keep the control stick from hitting the stops. It takes two hands, so use 'em both. On more than one occasion, I have finished the tailslide to find that the elevator trim had moved a substantial amount. At first, I thought maybe I was bumping it with my elbow. Finally, after several episodes, I determined the air load on the trim tab was great enough to overcome the friction lock on the cockpit trim lever! The moral of the story is, don't panic if the trim is all out of whack after a really good slide. Don't bail out unless you KNOW the airplane is broken.

You will find that good tailslides will improve your other vertical maneuvers. The tailslide requires the most precision on vertical entry and lots of concentration on backwards maneuvering. Just keep practicing until you get it right. As usual, be careful, keep practicing and keep on a grin'in.

ALL BUILDERS - Please send us your ideas and photos for making bungee cord covers!

Frank Langdon's Adjustable Shock Strut For Acro Sports



NOTE:
HOLES AND SLOTS ARE 1/4"

PROCEDURE:

1. Machine 4 collars from 6061 T6 aluminum.
2. The lower tube must be slotted as well as the upper tube to allow it to slide when the pins are in place. (pins use NAS 1104 high strength 1/4" bolts)
3. The adjusters for varying the length of the struts are as follows:

(i) the lower tube is "fish-mouthed" and a threaded sleeve is welded into the upper end. (made from 4130, 1 1/2" long) Prior to welding, thread bolt, later to be discarded, full depth of the sleeve to protect the threads.

(ii) An AN8 bolt approximately 4 1/2" hole is drilled through the sleeve and shank just below the bolt head

4. ASSEMBLING THE STRUT:

(i) The overall strut length must be calculated and some adjustment in both directions should be allowed. NOTE: lower strut slot must be longer than the actual travel to allow for this adjustment.

(ii) Scw adjuster bolt into lower tube to required length and lock with locknut. Unfortunately you will need to use vise-grips because the locknut has been machined round to fit the tube.

(iii) Onto the upper tube place sliding collar, spring, and the lower tube into the upper tube. Using a 1/4" bolt pin collar, upper tube. and lower tube together.

(iv) Place spring in position, then lower collar, compress enough to get the lower pin in position by using a bar clamp and suitable spacers. A pre-load of an 1/8" is enough.

NOTE:

(i) The 1/4" bolts are used as pins because the load limiting factor is the slotted tube, with an ultimate yield of 9690 lbs.

(ii) The NAS 1104 bolt at 7850 lbs. ultimate is in double shear which becomes 15700 lbs. Regular AN4 bolts are acceptable.

(iii) The threaded sleeve has an ultimate yield of 10550 lbs. I used PRODUCTO die springs XHP812 which have the same specifications as those sold by Aircraft Spruce but not necessarily the same brand.

FOOTNOTE:

After assembling my struts, I realized that I had forgotten to grease them. I liberally applied oil but still felt the need to apply grease. After about 40 hours of flight time, I dismantled the struts to grease only to find they were in "as new condition" - No wear, no cracks, no bends,, this after fairly vigorous workouts. Ironically, after making adjustable struts, I had no need to adjust them. The lengths set were right on. With my original non-adjustable struts, I had cut and re-welded twice and still they were not correct. C'est la vie!

Good Flying,

July 21, 1996

Dear Ben,

In all my building experience over the years, it never ceases to amaze me how sometimes the most complex problems can be overcome by simple remedies.

I never realized or understood completely the cooling process, (airflow), of an airplane engine, (Volkswagen in this case), which utilizes the eyebrows over the exposed cylinders. I always thought if the eyebrows were fit properly directing the airflow over and down between the cylinders that sufficient cooling would result.

Most of the time it works. My recent experience with my Pixie revealed some very interesting results which I'd like to pass on to you.

1st, I decided to be rid of the Posa

carb for several reasons, parts, leaks, etc.

2nd, I installed a Zenith carb, float bowl and external mixture needle. By changing the carb I was forced to modify my intake manifold and add a portion to my lower cowl to compensate for the new carb size.

3rd, I failed to realize that my cowl-ing addition was causing a considerable rise in CHT thinking all along it had to be a mixture problem. After weeks of fiddling with fuel and mixture adjustments and many sleepless nights, I began to think about airflow around that front I added.

Apparently the flow of air was prohibiting the hot engine air from being exhausted out the rear of the bottom cowl. After opening the exhaust air

route and adding a deflector, I cooled the CHT 26 degrees. I suspect the airflow over this addition was causing air to flow up into the engine compartment and prohibiting proper exhausting of hot air. I flew it once with the whole bottom cowl off, and CHT was worse, then I knew it had to be turbulence or high pressure caused by the bottom cowl addition.

The fix was basic:

A. Enlarged bottom cowl air exit; B. Placed a deflector ahead of the air exit on cowl bottom. Sometime I can't see the forest from the trees!

Hope all this makes sense to you

Regards,
Doug Hagerman,
Tech Counselor

Correction To The Correction

In reference to the correction in the last Acro Sport Newsletter #53 page 4 top right hand side of the page, which reads; "3. Sheet 13 Zone A5 Location of Drag-Anti-Drag holes - Use Chord Line, not spar centerline as locator." I believe this to be incorrect, rather, the Drag Anti-Drag wires should be on the center line of the spar! Just like the plans show.

After seeing this correction in the newsletter (brought to my attention by fellow builder Dave Lucas) I, A. Checked my airplane. B. Double checked the Acro II plans. C. Checked how it was done on the Acro I, and the Pitts S-1, & S-2. And found all of the above to have the Drag Bracing on the centerline of the Spar.

Well before writing this article I felt it necessary to really check things out, so I called Acro Sport Inc, and talked to Jean, who referred me to Ben Owen. I then called Ben and we talked about this problem, who explained to me that this has been a constant problem over the years. He further explained that there have been airplanes built both ways with no apparent problems.

Now if you will, for the sake of an

experiment. Lets throw all the above discussion out for a minute, and lets attack this problem like we were designing this airplane. Problem; where should the Drag bracing go? If we look at the Compression ribs (what the Drag Anti-Drag braces pull on to create the strength between the two parallel spars) we find the compression members are on the Spar Centerline. It should stand to reason then that we would want to pull on the center of this compression member. I cannot for any reason understand why you would want to pull 3/4 of an inch (23/32" front spar. 17/32" for the Rear) below the centerline of the compression member, I.E. the Chord line, can you?

I do realize that on the top wing at the butt rib, the fittings are on the Chord line and the Drag Bracing attaches to the fitting, below the Compression member. On the bottom wing the Compression member is lowered to be more in line with the Drag wires (on the Butt rib).

I recall that in the Acro Sport Newsletter #51 there is an article by Joe Spencer about problems he had with Drag Wires. I wonder if this could

have been part of the problem?

Also it seems that the bellcrank would fit different as it is designed to go around the Drag Wires in the bottom wing.

I would like to hear from anyone on your thoughts in reference to this, and especially if you put your wires on the Chord Line. I would like to know how many airplanes were built this way and if you have experienced any problems because of this.

And lastly if you have put your wires on the Chord line and would like to change it, providing you are not too far along. You could plug the holes with a dowel rod, re-face the Drag blocks with 1/16 ply and re-drill on the CL.

I now have about 15 people that call me for the builder assistance, and I welcome all. Sometimes I am a little hard to get a hold of. But I can usually get back to you in a day or so. I love to talk ACRO!

Experimentally,
Michael E. Finney
7600N County Road 650E
Albany, Indiana 47320
Ph. 317-789-6789

October 17, 1996

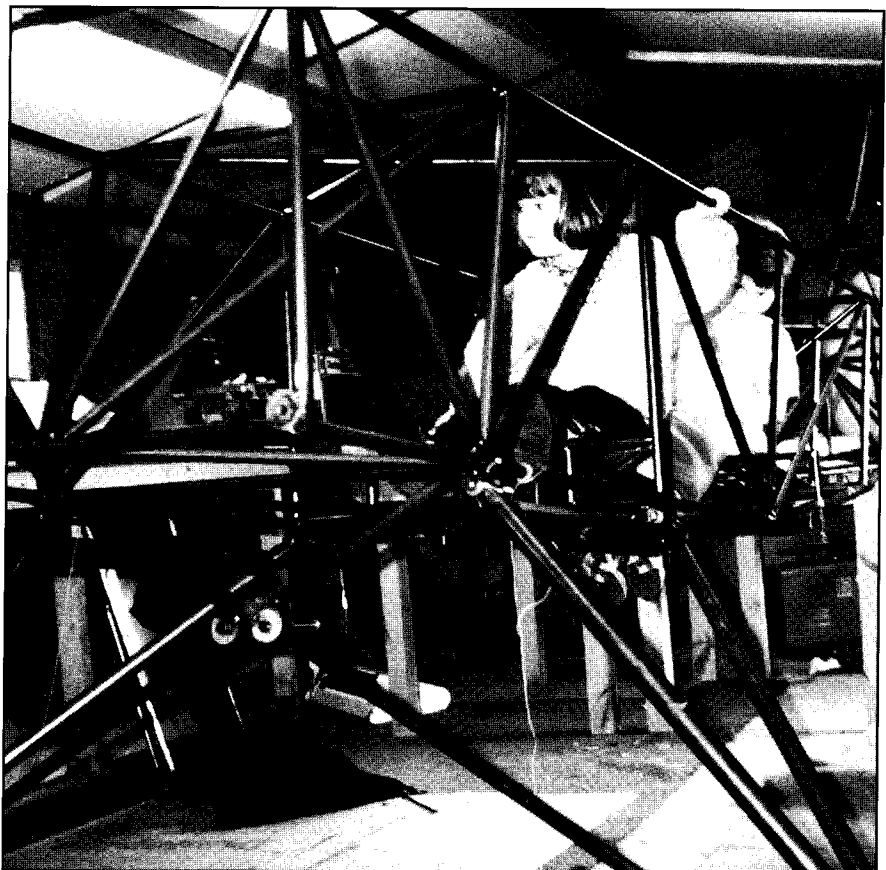
Dear La Fonda Jean,

I find your newsletter very helpful with the excellent tips and encouraging stories about building an Acro II. I began the project in June '93, yellow plans, and to date have built all wing ribs, aileron ribs, completed fuselage, undercarriage and tail feathers. Ready to build engine mount next. Engine will be 180 HP O-360 fixed pitch prop.

Would you be able to advise on the best prop for aerobatics? Would Sensenich 76 x 56 be suitable?

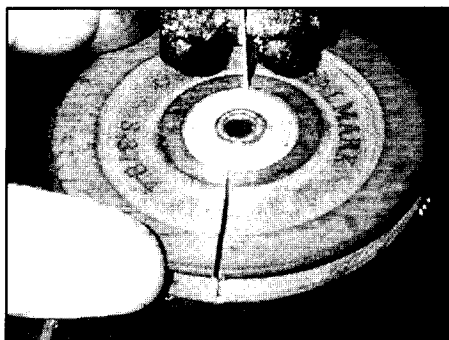
Many Thanks,
Paul Gorvett
Pant-y-sais Farm
Jersey Maring, Neath
West Glamorgan, SA10 6SP
South Wales, U.K.

Editor: Yes, the Sensenich 76 x 56 is the standard climb prop for 180 HP. Ben Owen will be sending you the names of other builders and the props many of them are using. Also, see our Newsletter #50 for more on Sensenich props.

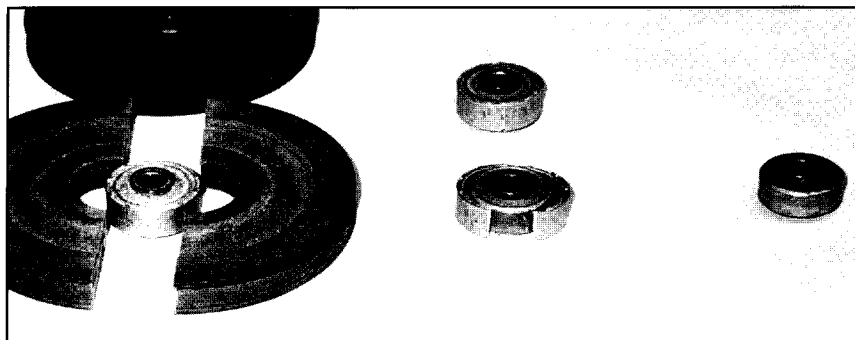


Kate Gorvette and cousin Don try on the Acro II.

An Alternative For The KP4 Fafnir Bearing



Cutting bearing from surplus pulley.



PRESTO! Inexpensive competition for Fafnir.

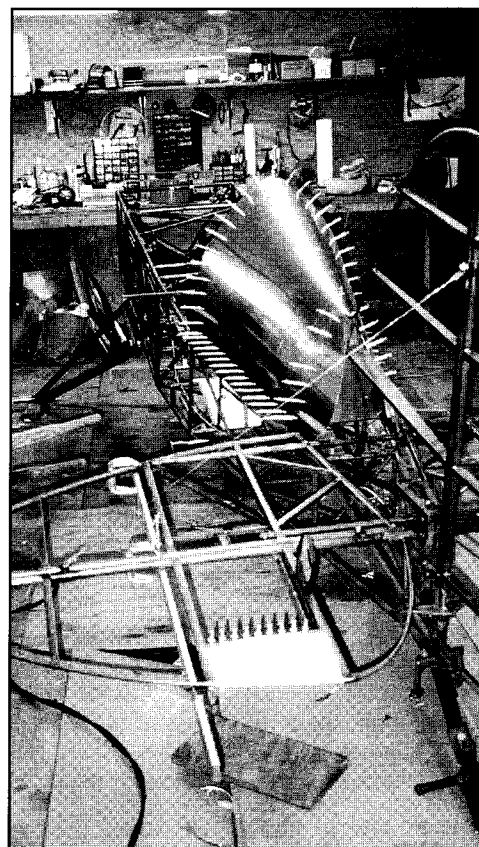
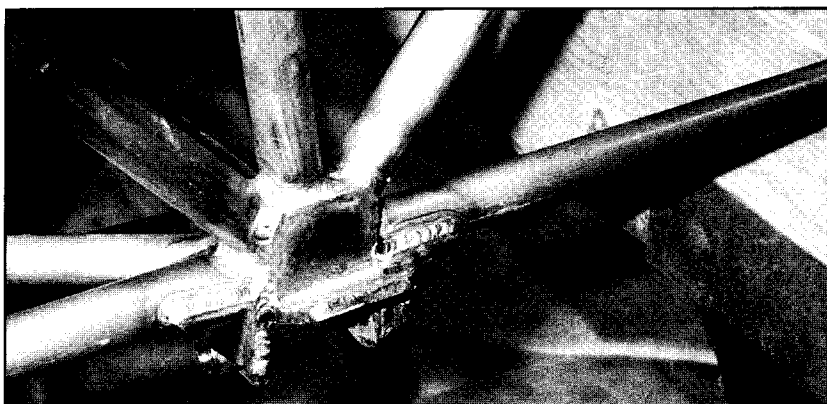
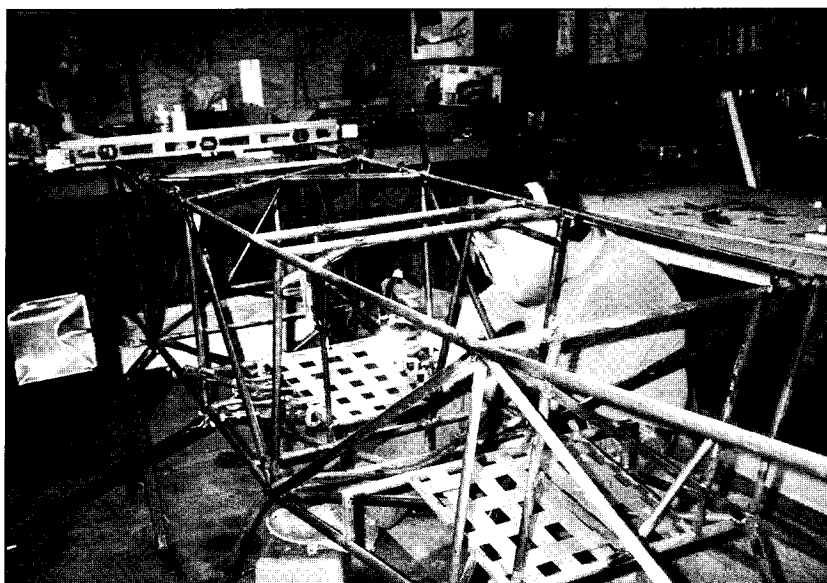
By Douglas C. Apland
21464 Lafayette Drive
Chippewa Falls, WI 54474
715-723-5919

One evening while sitting around the campfire during Oshkosh '94, I was complaining to a fellow chapter member and home builder about the high price of Fafnir bearings and rod ends. During the evening conversation, another member was showing off his bag of "goodies" he had purchased dur-

ing his visit to the fly-market that day. Spying an aircraft pulley in the bag of goods, we began to look the inner bearing over. It did have a .250" center hole; it was 1/3rd dimensionally correct! Further measurements showed it was within .002" of being the correct width. The proof would be in the outer dimension of .9014". (The reason for this dimension is so they will press fit into a 1"x.049" wall tube of which the Acro Sport is full, i.e. control sticks, aileron bell cranks). After hack sawing the phenolic away using the rear bumper of the

motor home for a work bench, we had the bearing freed but it was too large. A closer look revealed a thin screwdriver placed in the saw kerf and twisted revealed the steel shell of the bearing itself. PRESTO! .901 o.d. x .482 w x .250 i.d.

The following day a trip to the fly market yielded a bag full of the proper pulleys which contained the same bearings as the one extracted the evening prior. I chose to buy new AN210-4B pulleys @ \$3.00 from a surplus dealer.



Left Above: Early stage of construction of Doug Apland's Acro Sport II. Left - Detail of forward landing gear and flying wire fittings displays excellent workmanship. All welding was T.I.G. process. Above - Turtle deck was modified by adding 4" to height.

Dick Merkel Progress Report...

January 12, 1996

Dear Bill,

Enclosed photos reflect progress on my Acro Sport. Winter seems a good time to build airplanes. We don't clean snow off our runway so flying must wait for January heat wave. A couple of these I overlooked when I sent the others. The rest show efforts since Oshkosh'95. Wing tip lights are on upper wings. Super Fil sure works good for fairing in things. Did have a little problem with it ending up rubbery when I got careless mixing it. That's the reason for the scale in the pics. The I struts came out particularly nice. Lots of sanding, but the lack of voids in the Super Fil made the job very satisfying.

Covering the wings is all the fun I expected it would be. After watching the demos at Oshkosh for 15 years, I guess I was ready. Took me a while to get the knots down for the stitching, but the video helped my poor memory. Only real problem is my ever lasting inclination to want to move on to the next step before it's time. By wing panel no.3 I'm about over that. I also found that I must stay away from the stitches when sanding on the silver. I learn the hard way!

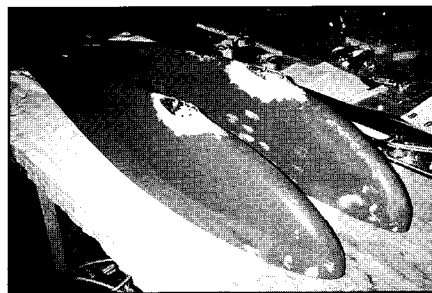
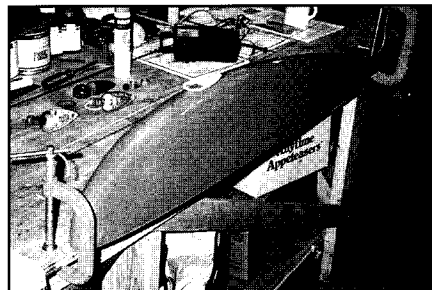
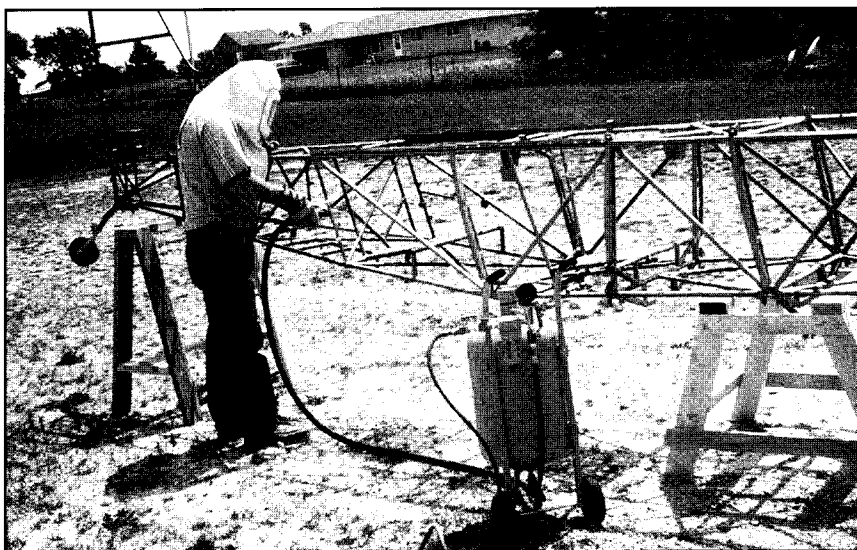
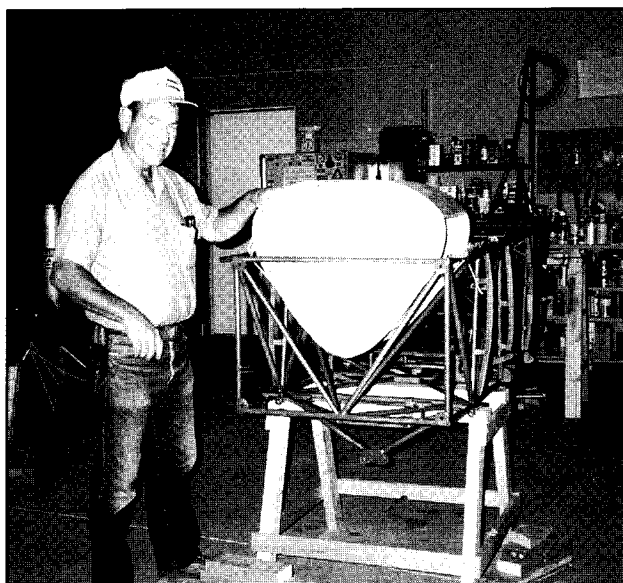
Engine is still at Belvidere Aeromotive being upgraded and overhauled. Don't know if we'll get 200 HP out of that O-320 or not - but it's fun trying.

Will begin wiring and plumbing the fuselage when the wings are all at silver plus 3. Must sandwich that around a couple of trips south to warm up. We're having a real winter here in Northern Illinois. Just an update. Regards,

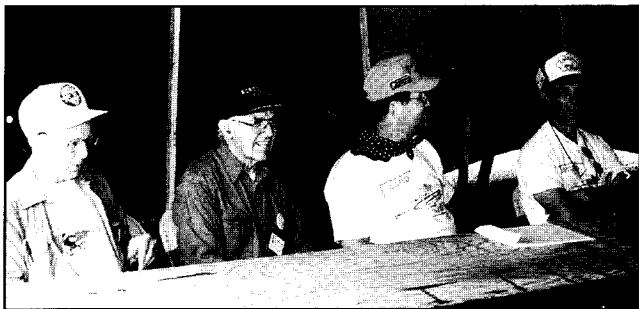
Dick Merkel
10087 Cemetery Road
Pecatonica, IL 61063-9012

OSHKOSH '97
WEDNESDAY JULY 30
THRU
TUESDAY AUGUST 5
(Make your plans accordingly).

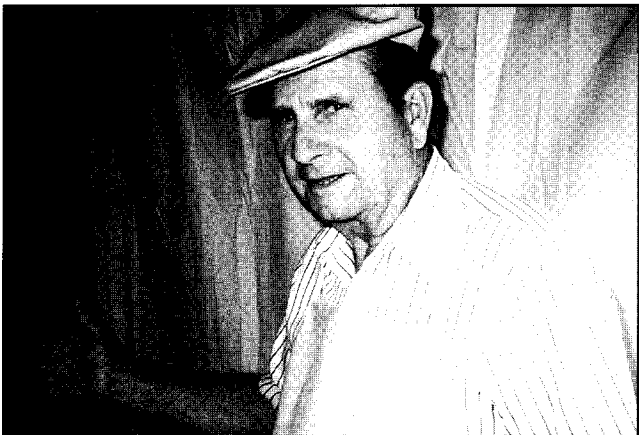
Right - To check fit before cutting metal Dick fits cardboard mock-up of the fuel tank into fuselage bay. Below - Protective headgear in place during sand blasting of tubing prior to adding primer.



Above right - Positioning template for nav light prior to adding Super Fil, lower right. Above shows finished installation after blending lights smoothly into wing tips.



'96 Acro Sport forum panel - Bill Blake, Paul Felkner, Steve Manweiller, and moderator Don Baker.

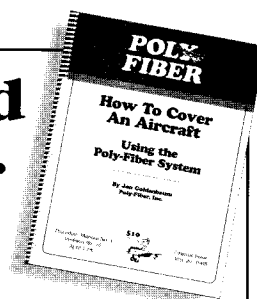


RAY STITS - master of Poly Fiber, covering Pober Jr. Ace at Oshkosh '96.

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