ACRO SPORT Newsletter

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John Flanagan's Acro Sport II

by John Flanagan, 317 Rilla Street, Elmira, NY 14903 (607) 734-0469

My story is much like many others–I attended Oshkosh and saw Paul's Acro Sport N9EA and knew I had to have one. Shortly after returning home I ordered the plans, and eight years and approximately 2500 hours later I had my Acro Sport N653JF. That's the short version, now for some details.

I served four years in the Navy as an aircraft electrician working on F8U Crusaders, F4 Phantoms, and A6A Intruders. On release from the Navy I went to work for Schweizer Aircraft Corp. as an aircraft assembler and worked on a number of sub-contracts, my favorite being the G-164 Grumman Ag Cat. I had always loved biplanes as a youngster–Stearman and Waco–and to this day my all-time favorite is still the Waco UPF7. I started flying in December 1969 and passed my private checkride in June 1970 at 40.5 hours T.T. Since then I have added Comm., Inst., Multi-Eng., CFI and Glider. During a layoff in 1979 I got my A&P and worked for the local FBO as a mechanic and part 135 Charter pilot. During this tenure I convinced them that every plane we worked on needed a test flight, so I got to fly quite a number of different aircraft. After six years of this I returned to Schweizer Aircraft where I work today as a Flight Test Inspector and D.M.I.R., (Designated Manufacturers Inspection Representative)

The Acro Sport was constructed from plans and material from Wag Aero, Wicks, Aircraft Spruce, as the main suppliers, and a number of others for smaller items. The plans were followed with no deviations except for welding on four threaded fittings on the foreword fuselage longerons. These are used to install Tubeseal to the inside of the longerons and then sealed with a capscrew plug. The reason for this other than the obvious is that if future welding needs to be done, the plugs can be removed preventing pressure buildup in the tube from welding heat and flaming oil from spraying out of the tube at the weld. The project began with the fuselage, then tail surfaces and gear. The wings were built in the cellar during the winters and the rest in a 24' x 24' two car garage during warmer months.

Although I had previously restored a Piper J-4 and a J-3, this was my first complete building project. Even though

I have an aviation background, it was very much a learning experience and except for some minor frustrations, very enjoyable.

The engine is a Lycoming IO320BIA that was purchased disassembled for overhaul. I completed the overhaul and installed the engine which presented its own problems. It seems this engine uses a different focal point for its dynafocal mount than the more common carburetor models. Also the injector servo is on the rear of the sump making the engine mount more difficult to construct. After solving these problems the 160 H.P. engine seems a good match for this aircraft. One of the goals of this aircraft was to keep it light and this engine helps here. The aircraft weighs 990 lb. on a certified aircraft scale. It has an electric system with a 35 amp. Honda alternator and Gel Cell battery.

The covering is Stitts process with HS90 fabric. The finish is Aerothane white and Imron green. The propeller is a Sensenich W74EM7-58 wood prop chosen for several reasons: 1. It was cheaper, 2. It was lighter, 3. It is pretty! It is a good fit for this aircraft; the climb rate is good and it makes red line at full throttle in level flight.

The first flight was in August 1992 and was one of the highlights of my life. The flight was unannounced–no friends, no cameras, no outside pressure, just me and my creation. This is the way I would recommend all first flights. If things don't feel right, abort and find out why; don't be pressured to make the flight because people are watching. You can always make the

EDITORIAL

The Joy Of Freedom

Bill Berrick, Editor

We had a welcome break in the early winter weather late in November; temperatures soared into the fifties signaling time to get the Acro Sport into the air at least one more time before Spring. I have largely neglected my open cockpit flying all of this year, sometimes for cold temperatures, but mostly because I was involved with flight testing my newly hatched GP-4. It is a low wing wooden retractable, two place side by side, 1300 pound, 200 HP, IFR instrumented rocket that spends most of its time at 200 MPH or above. It's at the extreme opposite end of the homebuilt types in purpose and performance from our Acro Sports.

The GP-4 is easier to land than the Acro Sport; it has tricycle gear and you can even see the runway! But otherwise it is a bit of a handful in flight demanding constant attention to instruments and controls as well as looking out of the windows. The elevator sensitivity is similar to the Acro's, but only a momentary neglect of stick pressure has the airspeed moving past my 250 MPH redline. The ailerons feel quite heavy compared to the Acro, perhaps mainly due to the forces of higher speed. It is stable in flight, a good instrument platform, and I'm working on re-gaining my IFR currency – also a clear demand on pilot attention. I have a way of making WORK of my hobbies, and flying the GP-4 fits that category.

One of those warmer afternoons after practicing IFR work in the GP I pulled the Acro Sport out of the hangar, ran the much shorter checklists and launched into the blue. With no concern for getting the gear up, (or remembering to get it back down!), I realized I was able to climb out hands-off at whatever angle I cared to choose until I needed to make S-turns for visual clearing out front. This was the beginning of the PURE JOY OF FREEDOM to do as I pleased that day. Granted, I still needed to use my feet on climb out, but by now that comes naturally.

I flew to a favorite practice area, climbed to 4500' above ground level, (so I'm timid!), and did the Sportsman maneuvers for awhile. I don't make work of aerobatics and therefore haven't been good enough to compete. I like to try to be more graceful and less violent than the slamming around that counts as good in competition. Maybe I'm just too lazy to practice, but also I like my creature comforts. I was glad when they dropped snap rolls from the Sportsman sequence. Those always seemed like cruel things to do to a pretty airplane and to my no-so-pretty body. After wringing it out for a while, I tooled around enjoying the beautiful day, flew over the new SAC Air Museum on I-80 between Omaha and Lincoln, (everything from B-36 to SR-71 there!), and generally just enjoyed being in the air. Reminded me of Jonathan Livingston Seagull – some birds fly to eat, some to travel, but Jonathan just for the love of flying – something like that.

Many of the letters we get from countries outside the USA remind us of the wonderful FREEDOM we have here for building, registering and flying our homebuilts. We have a lot to thank Paul Poberezny for the part he has played over the years in securing those freedoms for us, in addition to creating these wonderful airplanes for us to copy!

I also want to thank Ben Owen for the countless ways he has helped us all – the clear authority when a builder needs help; and LaFonda Jean Kinnamon for making the plans, the forums, and the Newsletters available. Finally, my gratitude to all of you who have provided the photos, articles and letters that are the heart and soul of the Newsletter. It can only become better and more useful if you give the support you have given me to your new editor – Scott Spencer, 4429 Englewood Road, Helena, AL 35080, (205) 620-4313.

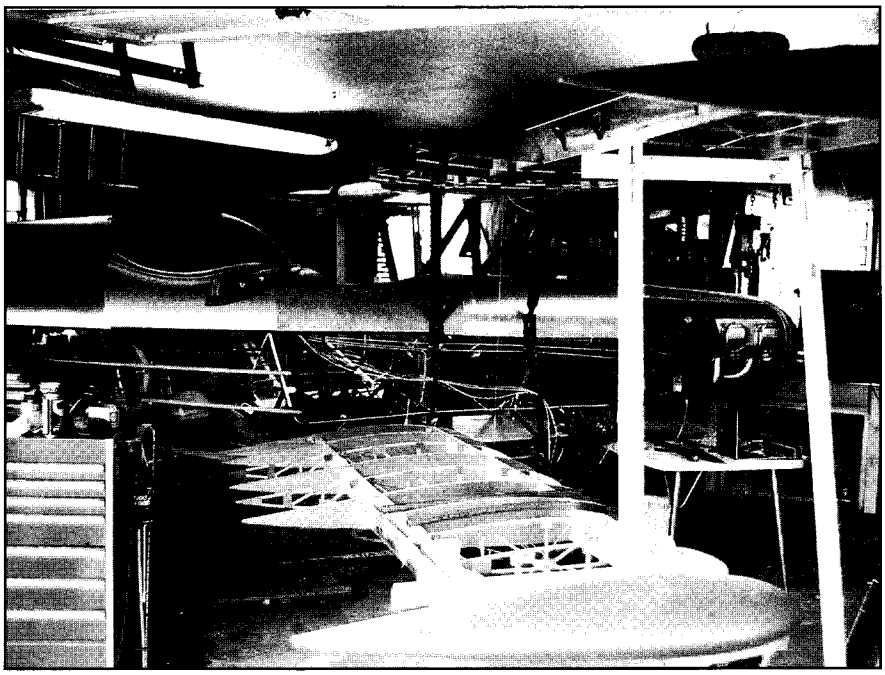
Above — Grandson Michael Berrick, Associate builder and clean-up man. The Editor's Acro Sport I and new GP-4.

"first announced flight" later. After 125 hours the airplane and I are still getting acquainted and every flight is an adventure. I find that the aircraft demands my full attention and responds by doing everything asked of it. I do mild aerobatics–loops, rolls, etc. and plan to get some aerobatic dual soon.

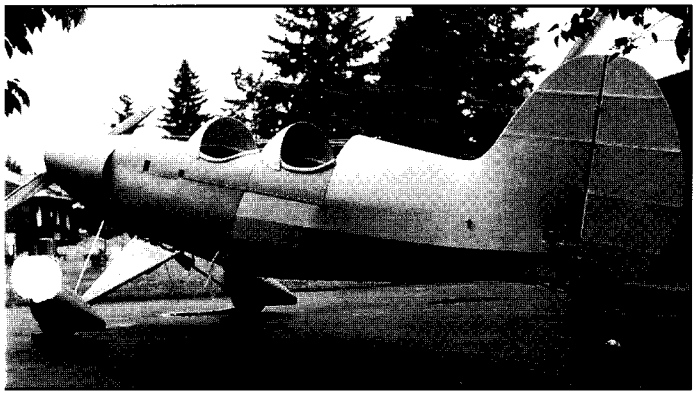
The only things I would change if I were building another would be to change the seat back to accommodate a parachute. I am six feet and 205 lb. and things are cramped with my chute on. It is a Strong-Thin backpack about as thin as you can get. I would advise builders to purchase a chute, put it on and build the seat to fit.

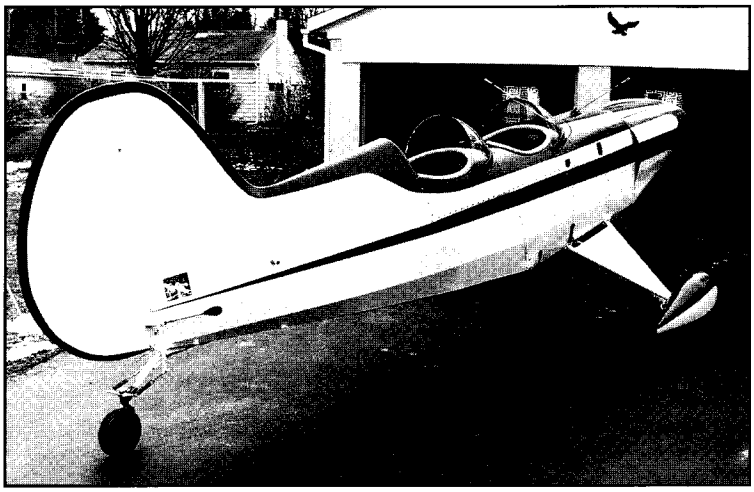
Also my 26 gallon fuel tank turned out to be 22.5 gallons. At 10 G.P.H., legs are short. I would make the tank larger and add a header tank for the flop tube and aerobatics.

I would be glad to help any builders any way I can; fell free to write or call.

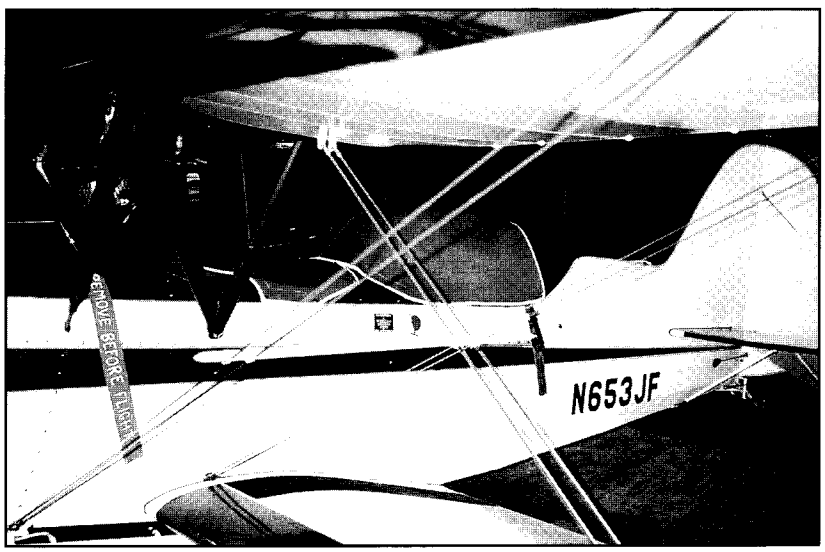


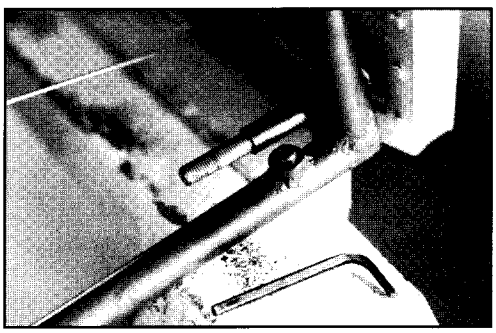
Did the Flanagan cars spend NY winters in the driveway?

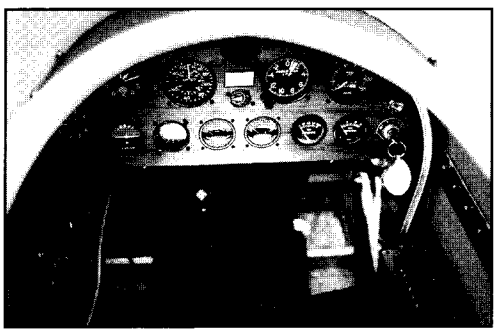




Above — John's immaculate covering job and sheet metal work.
Right — Beautiful curves and trim like these required skill and patience.



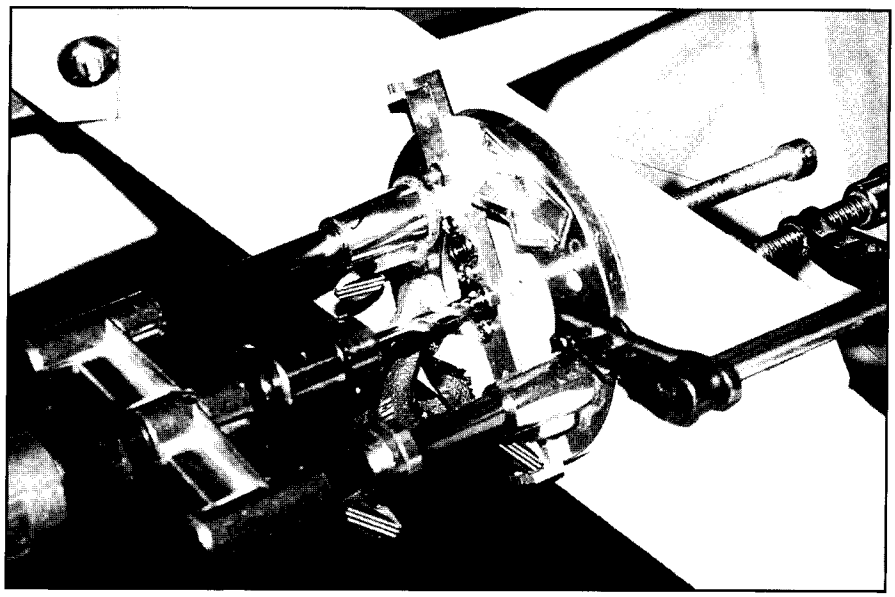




Above — Nicely fitted and matched cockpit covers.
Right Above — Flanagan longeron fittings for adding Tubeseal after welding.
Right — Everything John needs on a neat, easy to see panel.

Drilling Holes With Finesse And Accuracy

by Don Baker



Don Baker's modified drill guide.

The building season is now in full swing, i.e. it's winter so let's talk building! When building an airplane from blueprints, it becomes quickly apparent that accurate hole drilling is important. Having built the Acro Sport and being in the middle of another project, I have acquired many hours of drilling and thought I would pass on some things I have learned.

There are certain areas in an airframe which require relatively precise drilling operations, like wing attach fittings and others which are not so critical, like control cable pass-through holes in the firewall. However, I approach all hole drilling with the same mindset: try to do the best you can and maybe it will turn out to be acceptable. As with cutting you should always measure twice, (or three or four times), and drill once. Accurately drilled hole diameters can cost you a lot of time or bucks if they are located in the wrong place.

My drilling tool arsenal, at the time I built the Acro II, is about the minimum required. It consists today of pretty much the same tools. You need at least the following: a drill press, and electric or air hand drill, (3/8"), a drill guide, fractional drill bits, (1/64 through 1/2 inch), numbered drill bits, (1 through 60), cross-slide vise, Dremel tool, and a set of dial calipers capable of 0.001 inch resolution.

I like the plain old high speed steel, US made, standard 118 degree point, black oxide drill bits. Drill bits should be sharp. There are sharpening attachments made by "General" and others which attach to the bench grinder and do a respectable job of sharpening bits, and I have one. However, with practice you can easily sharpen them freehand on the grinder. You can tell if a bit is properly sharpened by looking directly at the end of the bit. You should see two equal length straight edges, (the cutting edges), which appear exactly parallel with each other. If you mentally draw another line following the center ground point of the bit, it should be about 65 degrees relative to the parallel cutting edges, (25 degrees short of perpendicular). If the rake is ground wrong, then this angle relationship will not be correct. Keep regrinding until it is right. Don't over-heat the bit when grinding.

In really critical areas, (wing attach fittings), I like a close tolerance fit on all my drilled bolt holes. In the steel fittings, I like the bolt to be a firm push fit. If it scrapes away a little of the cad/chromate plating on a new bolt, then the fit is just right. I do not like "drive" fits, (hammering), because too much stress can be set up in the drilled part. Often times it is necessary to clamp together and match drill parts, such as wing attach strap fittings. I have found that gang drilling more than two pieces at a time can create poor fitting holes. This is due to the drill shavings which wear away the hole diameter on the top pieces which will have the desired accuracy. This seems to be true whether or not cutting oil is used.

Sometimes the really good fit cannot be achieved with drill bits as they come from the box. Even good quality bits will sometimes be slightly too big in diameter for the fit we want. There are several ways to help prevent over-size drilling of critical hole diameters. First, you should approach the final drilled diameter in steps. The thinner the material being drilled, the more steps are required. Always under-drill the finished hole by one drill size, then change to the final size and make the final pass. This helps keep the diameter accurate and also keeps the hole from "three-siding" which is caused by a sort of wobbling of the bit in thin material. The final pass is like a ream pass and cannot correct for a three-sided hole that is already too big at the corners. Therefore it is best in thin materials, (less than 1/4th of the bit diameter), to make two or three progressive size holes before the final pass. For example, drilling a 3/8 diameter hole in 0.062 inch thick 4130 sheet, I would start with 1/4 inch, (optional), then 5/16 inch, then 23/64 inch and finally 3/8 inch. You will get a perfect hole every time.

If the bit itself is slightly too large, it can be ground down a thousandth of an inch or so, if you desire. This is done by chucking up the bit in the drill press and using the Dremel tool with a fine grinding stone. Put the Dremel tool in the cross-slide vise and locate it to where the stone is just barely touching the side of the bit. With the Dremel tool running and the drill press running on slow speed, move the bit fully up and down with the drill press feed. Check the diameter with the calipers, then feed the cross slide and grinder a tiny bit closer to the drill bit and run the drill bit up and down again. Continue in this manner until the diameter of the drill bit is where you want it. This works for under-sizing drill bits up to a few thousandths of an inch. Any more will grind away the cutting edge of the bit shoulder and create too much drilling friction and heat. Be sure to chuck the bit very accurately so that the same amount is ground away from both sides of the bit and evenly up and down its length.

By the way, I have found that a drill bit may need to be re-chucked, maybe even several times to get it to run true in the drill press. Sometimes this is not critical, but for accurate positioning and hole locating it may be very necessary. With all this chucking and drilling, you get a lot of practice changing bits, so I keep the chuck key on the end of one of those retractable key ring chains. It is meant to be worn on your pants belt, but I clip mine to the pulley shroud at the top of the drill press and the chuck key is always there, out of the way, and never lost.

An important drill press accessory is the cross-slide vise. A low cost Taiwan one is OK. You can use it to accurately position workpieces and get hole location to tolerances approaching 0.001 inch. It can be used on awkward sized work pieces as well. For instance, to drill holes in the end of a wing spar, for the wing attach plates, the cross-slide vise can be used on the drill press for positioning. For this type of drilling, supporting the other end of the spar is critical. I use two roller supports with each roller parallel to the length of the spar. The roller supports are spaced about a foot apart and a length of pipe is laid on top of, and at right angles to the two roller supports. The pipe acts as a third roller and the spar lays on top of the pipe. Now you have the spar supported and it can move freely in either the X or Y direction as the cross-slide vise is re-positioned. This nearly frictionless support lets you move the spar as though it were floating, which helps positioning accuracy tremendously. I have actually supported and drilled spars on complete, (uncovered), wing panels in this manner.

When drilling spar holes with the drill press and cross slide vise, I use the pre-drilled spar plates as locator templates to match drill the spar. As each spar hole is drilled, a bolt is inserted to properly locate the template for the next positioning operation. To assure no accidental reaming of the spar plate hole during setup, I normally chuck up a straight length of drill rod, (same size as spar plate hole), to accurately position the cross-slide vise. This prevents chewing up the spar plate holes with a rotating drill bit and is easier to see than the end of a drill bit. The drill press should be running when positioning to compensate any chucking wobble. Positioning to within 0.001 inch is possible with this technique. Next chuck up the bit and drill the hole.

Sometimes, accurate drilling without the benefit of a drill press is required. Now we are faced with the task of positioning accuracy as well as perpendicular accuracy. Again, I would use the pre-drilled spar plates as locator templates to match drill the spar, but it can be difficult to get each hole precisely perpendicular so that the far side of the spar hole also matches the spar plate holes. We do not want to oversize the spar holes to accommodate skew errors, rather we want the hole to be accurate. I like hard push fits for bolts into wooden spars.

I devised a tool which works quite well for this task. It uses a standard drill guide which can be purchased from Sears, etc. for $20 to $25. Mine is a rigid base unit, although some have adjustable angle bases. It is essentially a slide bearing which slides on two round guide rods and guides a hand drill for reasonably accurate drilling. It can be clamped with C clamps to the workpiece once hole location has been properly set up. However, the accuracy of the basic drill guide is somewhat poor due to sloppiness of fit of its parts. Also, I do not like to use the drill spar plates as drilling guides for fear of over-reaming the spar plate's hole. They are OK for locating and drilling shallow pilot holes, but not as the sole drilling guide. So I improvised an improvement to the drill guide tool. It consists of a ball bearing pressed into an aluminum bar, (1/4" by 1"), which is then bolted to, and exactly in the center of, the drill guide's base plate. The ball bearing is available for a few bucks where they sell router supplies and are normally used on carbide router bits. The bearings come in two sizes, one has a 3/16" i.d. race and the other has a 1/4" i.d. race. Use the 1/4" one for 1/4 inch spar holes and the 3/16" ones for 3/16 inch holes. The ball bearing acts as a precision, no slop guide for the bit and if it is accurately located in the center of the base plate, it will repeatedly produce holes which are exactly 90 degrees perpendicular to the spar; (see photo). Simple, cheap and it really works.

If you need to drill really long holes, i.e., through a spar width, it can be difficult to get accurate exit on the far side. I always use the drill press and cross-slide for these operations. Get the spar firmly clamped in the vise so that it is exactly true to the drill bit. Use a small square, (machinist's square), to check and recheck perpendicularity. Use a drill blank or a short straight drill rod chucked in the drill press for this set-up operation. Then start drilling with a normal length bit and change over to a long 6 inch bit to finish.

Sometimes we need to drill and tap a hole. Getting a cocked start on the tap can create scrap. The obvious solution is to drill the hole with the drill press using the cross slide vise to hold the part. Then without changing anything, chuck up the tap in the drill press and begin tapping. Perfect alignment is guaranteed. Be sure to chuck the tap on its round shank, do not use the square drive head. Of course we would not use the drill press motor for the tapping. Instead, turn the drive belt by hand while applying down-feed pressure to the drill press. After the first one or two turns are established, the down feed pressure can be removed and the tap will self-feed. Back up and de-chip as you normally would when tapping freehand. Habits are hard to break, so when I chuck up the tap, I generally also unplug the drill press so I can't accidentally turn it on. Save a lot of taps that way!

Several times I mentioned the use of a drill rod for positioning. Rather than buying a bunch of drill rod, I use "index punches" for this purpose. They come in fractional, numbered and lettered sets, and are intended to be used as center punches. They are 8 to 10 bucks a set at discount tool houses and are well worth the money. You will find many other uses for them.

I hope this has been of some benefit to you. Meanwhile, keep on a grinnin' while you're buildin' because flying season is a comin'!

Acro Web-Site

Dear Bill,

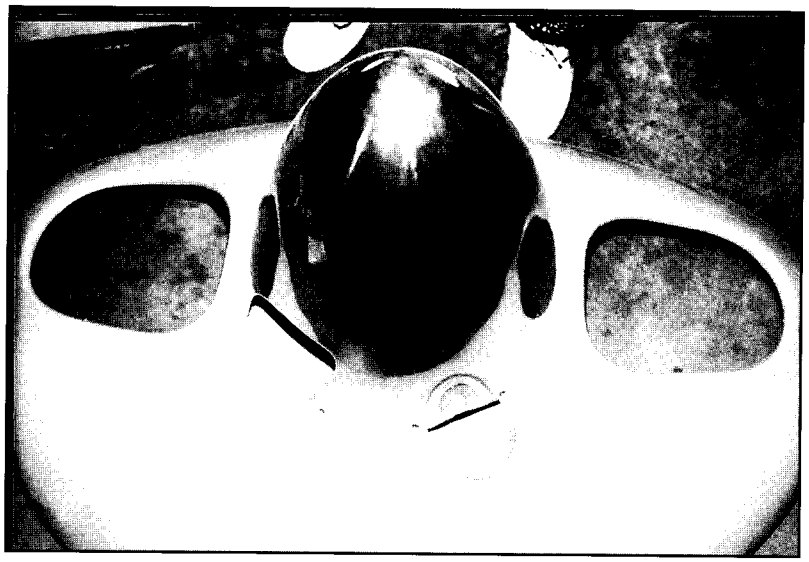
Got your e-mail from the last issue of the Acro Sport Newsletter and wanted to touch base with you on a couple of items. First of all is a potential item for a future newsletter. I know that an increasing number of Acro Sport builders have e-mail and connections to the Internet. I've come across a few and keep in close contact with a few builders through e-mail. It's been quite productive to bounce questions off of each other and a good motivation influence for myself. Several other home-built aircraft have builders' groups that permit the open exchange of this information among a group of builders, and I would propose that we establish one for Acro Sport builders. I would be willing to host such a service. Depending on the level of interest I can do this either as an e-mail distribution, or implement it on one of our local list servers. In order to get it going, I would need anyone interested in participating to e-mail me with their address – simple as that!

I have also set up a web-site that focuses on Acro Sports. It is located at: http://www.geocities.com/CapeCanaveral/Hangar/2785/

As it has evolved it has become a little bit awkward, and I am planning an update and remodeling job to make it more useful to Acro Sport folks, including a page on suppliers, etc. I also notice that some of the Acro Sport links that I had originally identified are obsolete and I need to go through and update that as well. Anyway, I would be happy to post construction pictures, completion pictures, and other information that would be useful to builders or anyone willing to send it to me.

Thanks,

Dave Hintenlang
12691 NE 131 Place
Archer, FL 32618
e-mail: david-hintenlang@ufl.edu
(352)392-8112 w, (352)495-3206 h



The 12" spinner does not clear the bump on the Pitts type nose bowl.

The rear bulkhead sets in about 5/32" before trimming s

Tips On Spinners From The Briar Patch

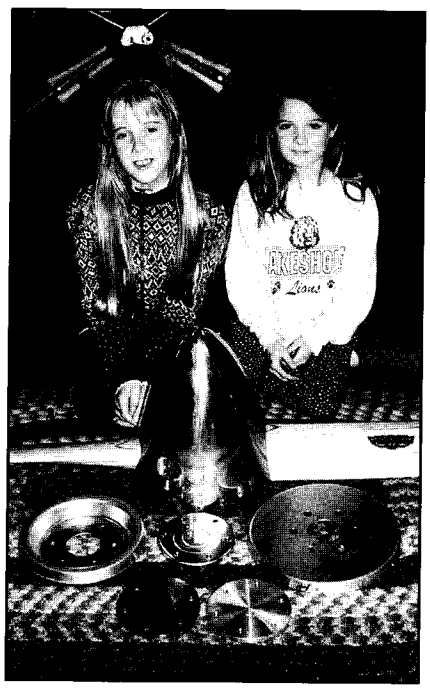
Most people use the Pitts style nose bowl or similar such as Aircraft Spruce part number MC-3A for the Acro Sport biplane, and a 10 1/2" diameter spinner. If you look at the bowl, you will notice that the flat area around the propeller opening ends up beyond the diameter of the spinner when a 10 1/2" spinner is used. This isn't a big deal, but I wanted the curve of the bowl to blend to the spinner a little better. A little measuring showed that a 12 inch spinner would be just about perfect. The spinner I chose, (Aircraft Spruce P/N BN-3), is 12 1/16" in diameter and 13 1/4" long. This was the most favorable ratio of length to diameter for this style airplane of the spinners I found in the 12 inch range. (This is my opinion – you get what you like!). The only real problem with this combination is the spinner won't clear the starter bump.

A decision must be made to a) cut a hole in the nose bowl for the spinner to clear, thus letting dirt invade the starter drive and snout bearing; or b) use a Toyota or B&C style light weight starter without the forward support bearing and remove the bump altogether. I'm, going to go with b). If you are still in the planning stages you could simply purchase the nosebowl without the bump, (A/C Spruce P/N MC-3B), and save the fiberglass work.

Now let's talk about spinner bulkheads. The first thing you need to know is that a spinner that is worth the trouble of putting on probably won't survive without a front bulkhead as well as the rear one. If the front bulkhead fits properly, you won't need to put screws through the spinner for it. When ordering the bulkhead you will have to know your propeller thickness or plan on a dimension greater than you expect to use and use shims to make up the difference.

The propeller I'm using is 3 3/8 inches thick. Another prop that I may want to try is 3 3/4 inches thick so I specified a bulkhead for a 3 3/4" stack up, and I made a 3/8" thick spacer. Keep this in mind; I'll come back to it later.

When fitting the spinner, the first step is to check the seating of the rear bulkhead to the dome. In my case the rear bulkhead seated into the dome about 5/32 of an inch. This is evident in photo #2. You can trim this off or leave it; it's your choice. I made some bushings to locate the propeller to the rear bulkhead, made paper patterns of the blade profile, and transferred this to the spinner dome per the instructions that come with the dome. The instructions also say you can trim the cutouts for the blades with tin snips – don't you believe it! The best method I found was to drill a series of holes inside the line then file up to the line. Take a lot of time here and it will pay off in a nice fit. Don't be surprised to find some difference in the shape of your prop blades from side to side this close to the hub. It won't be much, but your spinner will probably fit best in only one position. Once all this was done, I installed my 3/8" spacer and front bulkhead, then suddenly nothing came together anymore, but the back edge of the spinner and the bulkhead lined up perfectly. (Photo #3). The spinner was no longer seated on the rear bulkhead.



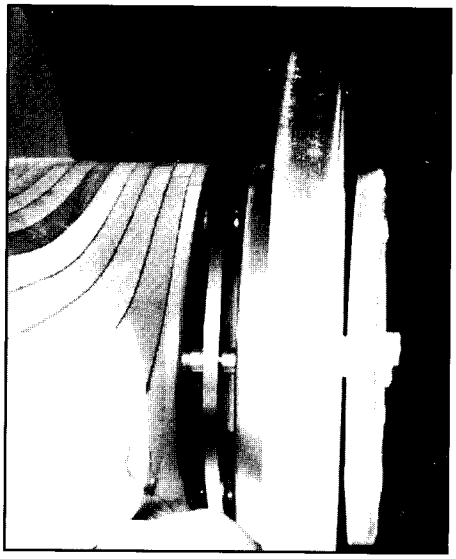
THREE BEAUTIES! Becky on the left, Laura on the right—and spinner.

If you've ever noticed an airplane at a fly-in with the rear edge of the spinner pulled in at the screw holes, this condition is probably the reason why. The builder probably had no means by which to face off the spacer or his prop was too thick for the front bulkhead he chose. Prop spacers are available from 1/16" to 3/8" in 1/16" increments. There is no good reason for not having a spinner with a proper fit.

In my case I made another spacer and machined a little off at a time until the front and rear bulkheads seated out

inner.

The back edges of spinner and bulkhead line up with spacer in place.



Left to right are: prop, 0.200" spacer, spinner front bulkhead, crush plate.

Aeroplane Factory

By Neil Sidders
235 Rowland Road
Monroe, LA 71203
381-343-3885

together. The spacer ended up 0.200" thick or just barely over 3/16" which would have been fine.

I've also seen front bulkheads with cracks running out from the screw holes. For this reason, I like to capture the bulkhead between the spacer and the crush plate. Photo #4 shows the assembly spread out on the prop bolts for illustrative purposes. Left to right are: prop, 0.200" spacer, spinner front bulkhead and crush plate.

The other point of concern here is the spinner to nosebowl clearance. Photo #2 is a little tight. Because I am using a conical mount engine, I could almost get away with it. At this point the simplest thing to do is to trim the back edge of the spinner even with the bulkhead. This will provide the same clearance that appears in photo #3 which is more acceptable. Just remember, dynafocal mount engines move around a lot more than conical mount engines.

I purchased my spinner unpolished. There are a lot of tool marks that need to be removed from the spinner dome before it can be polished or painted. I didn't mind the work involved but I polish lens molds for a living. If you are not willing to spend about 20 hours of metal finishing, the $68 polishing cost might be a bargain.

Photo #5 shows Becky on the left and Laura showing off the finished spinner and related components. The crush plate is in the center with the front and rear bulkheads on either side. At the bottom are the two spacers. The spacer to the left is 0.200" thick, steel, blanchard ground; the other is 3/8" aluminum, (6061-T6). The crush plate has the early Lycoming "L" inside a hexagon symbol to match the early Lycoming valve covers on the engine. It won't show on the airplane, but it was fun to do.

Well, that's about it. The only problem is that the 3 3/4" thick prop I was wanting to try won't work with the front bulkhead that I have. That's probably just as well because I would have to recut the blade openings to use the spinner. Decisions, decisions – !

June Acro Sport Fly-In!

Dear Acro Sport Enthusiast:

I know that you have built or own an aircraft designed by Acro Sport Inc. and we would like to advise you that there will be an Acro Sport – All Airplanes – Fly-in; Saturday, June 6, 1998 and Sunday, June 7, 1998 here at the Pioneer Airport at EAA.

We expect to have activities running all day Saturday and a half day or more on Sunday. There will be camping facilities on the premises and there are also hotels nearby. The closest one is the Super 8 Motel which is within walking distance and the telephone number is 920/426-2885.

If anyone is interested in participating in setting-up, helping with food serving, and putting on forums, etc., we would be happy to hear from you. Any suggestions for the event will be welcomed.

You will hear more from us as the event program is organized. You can contact either Bill Berrick, 11803 Hunters Cove, Omaha, Nebraska 68123-1119; telephone number 402/292-6832 or Ben Owen at the EAA 920/426-6530 to make reservations.

We are looking for this to be first in a long line of such events and hope you will consider participating. My very best personal regards.

Sincerely,
EXPERIMENTAL AIRCRAFT ASSOCIATION
Ben Owen
Executive Director
Information Services
inforserv@eaa.org

Letters To The Editor

November 9, 1997

Dear Bill,

I am responding to your request for some information regarding my Acro II which I finally brought to Oshkosh this year. It was a long construction which took a back seat many times because of other commitments. In retrospect, I agree that the plans, Newsletter, and the EAA Acro book were invaluable in teaching me how to do it all. Help from local Chapter 21 members as well as my personal mentor, Mr. Russell Goad, who built two champion Pitts, made the job easier; but it always is up to the builder to worry about all those little things like – is it right? Is it correct? Is it my best? The final result was very satisfying but like most people I believe if I did another one, I could do better.

I have found that my bird is tail heavy and I have gone to a small tail wheel and am considering moving the battery foreward to alleviate that condition. I don't know how much it will help for I still am learning how to land the darn thing! Each landing is a new experience! I had no tail dragger experience until now. I have removed all of the washers I placed as shims at the I struts and the flying characteristics have improved, so I guess my original product was better than I thought. I have been helped immeasurably in improving the flight characteristics by my friend Mike Zeller who has a couple of thousand tail dragger hours behind him.

So far I have done a few loops, spins, and rolls; and I mean to tell you that at that moment in time I realized that it was all worth it! Boy, what a thrill – even if they might have been poorly done. The plane is very forgiving and is wonderful to fly; landing it is another story for me.

I do have one story to impart and it involves flight testing and preparation for those fateful days. My first flight was in early evening, no wind, and no "friends" around. It was a nervous time, but everything went well, and it probably was my best landing so far. It lasted about 20 minutes and everything seemed to be working well. Second flight: two evenings later I decided to leave the airport environs because it was a beautiful evening with the sun starting to sink in the West. I was about five miles north of the airport at 1400 feet when the engine rather suddenly became rough and shut down completely. The Acro glides like a rock when there is no power, and I suddenly responded as any human would: First – denial, then fear, and then – resolve. I managed to put it in a soybean field with nary a scratch on me or the plane. It was back on the airport the next morning thanks to my friends, and ready to fly again by noon. The culprit was a fuel filter which appeared to be clogged with a wool-like substance. Also the paper filter which had been in that wobble pump for fifteen years was severely pressed together over half of its surface. Fuel couldn't get through. Lesson learned: altitude, stay close to home, and check and change fuel filters regularly while flight testing.

Something else to report: I finished my plane in polytone, both metal and fabric. The polyfiber people failed to mention that the blue dye in avgas is absorbed in the polytone paint finish, and I have stains which I can't get out. I have covered up some of them with a few unique green paint scheme applications.

A year or so ago I sent in a note to the Newsletter regarding a change I made to the plans regarding the application of the brake cylinder onto the rudder peddle rather than to the fuselage, as I felt it would move with the rudder in a more normal fashion. I like very much the way it has worked out, and I'm glad I made that change.

Well, I have nothing else to say except thanks to Paul P. for designing this plane and to all those people who have sent info to the Newsletter. I have learned a lot about construction and hope to learn how to fly it also, thanks to Don Baker's informative articles. Now there's an ACRO devotee! Any questions, write or call me: 812-985-2303.

Respectfully,
Dick Henry
651 S. Hebron Ave.
Evansville, Indiana 47714-4048

Dick Henry's beautiful Acro Sport II.

Australia, November 4, 1997

Dear Ben,

Thank you for your letter regarding the Acro Sport Fly-in at Pioneer airport. We'd both love to come, but it's highly unlikely! I'll put it on my calendar just in case.

A couple of things have come up in the last few Newsletters that I can comment on, as members may be interested. After 200 hours on bungees, I've just installed spring type shock struts, (Aircraft Spruce kit). My feeling is that they are slightly softer than the bungees, and make "wheeler" landings easier. In the past I would have been lucky to do one wheeler to 20 three pointers, (only because I preferred to do it that way!), so I'm not a real expert on wheelers. You told me years ago that the springs most probably wouldn't be as good on rougher strips, and my gut feeling would be to agree with that, but I don't have any "hard data".

When I built the Acro II, I built in another half degree incidence on the wings in an attempt to lower the nose slightly in cruise, figuring that I'd be doing a lot more of that than inverted flight, (which doesn't enthrall me greatly!). That worked as expected. Of course, the incidence of the tailplane needed a tweak by the same amount. That wasn't enough, as in cruise I needed quite a bit of forward stick with resultant trim drag, (confirmed by a look over the shoulder). I've been slowly increasing the tailplane incidence, with some speed increase, but haven't reached perfection yet. At a guess, I'd say that the packing under the front spar of the tailplane would be about 1 inch, but at the next adjustment I'll measure it exactly and let you know.

I fitted elevator gap seals and the change to handling was quite noticeable. I would recommend that to anyone. The idea of Kurt Schwabauer for aileron gap seals really interests me, and most probably will be my next alter-

ation. It will get a thorough "before and after" handling check, so I'll let you know the results.

Regards, Lloyd Shepherd

New Zealand, 8 June 1997

Dear Sir,

We have recently bought an Acro II and the EAA provided us with your address. This aircraft was built by David Comrie of Dunedin, NZ and has completed only 310 hours in the past 12 years if the log books are accurate. I have flown about 40 hours in it and fell in love and couldn't stand the idea of losing it, so we ended up buying it. The engine was out of hours and wasn't in the best condition to keep using, so it is being totally rebuilt and upgraded to 160 hp. It has a Christen inverted oil system and Ellison carb, and is a delight to fly.

I think the reason it has so few hours is the original tailwheel was prone to shimmy badly and gave some pilots a few scary moments. It now has a Cessna Agwagon tailwheel and its ground handling is simple.

I have a number of Acro Sport Newsletters which I find full of excellent information and wonder if there is still any regular news or any forum for advice for owners/builders.

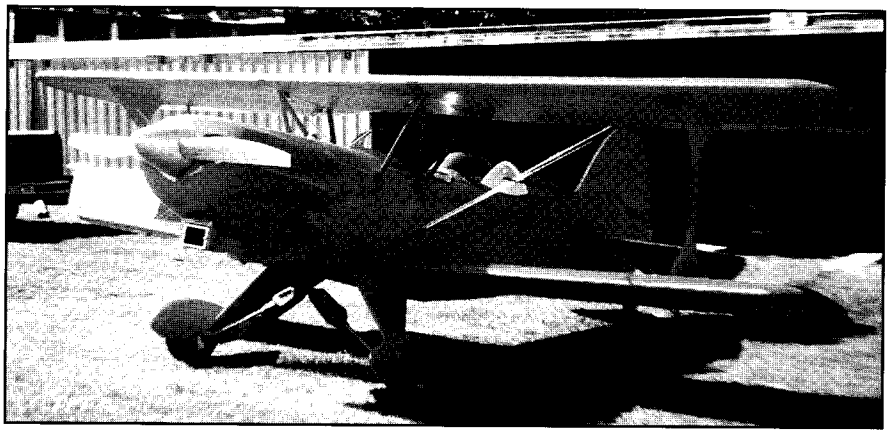
While the engine is out we are taking the opportunity to do some refurbishing and a thorough check of the whole airframe. The only problem found so far is a crack in the left undercarriage mount on the lower longeron.

I would like to run a breather tube from the Christen system right to the tail as after a bit of aerobatics there was always a fair bit of oil all over the underside of the aircraft. Would you know if anyone else has done the same, just how they went about it, and any possible pitfalls?

I had an Acro owner come and visit last year while we were still thinking about buying; Dan and Mary Hartz. I think they were from Florida; they are settling in NZ and were looking around. I was hoping they would bring their aircraft out here as from what I know there are only two Acros in NZ and another would be nice. Dan said he had built the Acro I and it had 180 hp and climbed like the proverbial angel. Be fun to have a flight in one like that! I'll be interested to see how ours performs with a new engine and a few extra horses.

Look forward to hearing from you.

Vincent & Alison D'Ath
30a Courtney St.
Motueka
New Zealand



John Wing's rich reward for "STAYING WITH IT!"

Acro Sports,

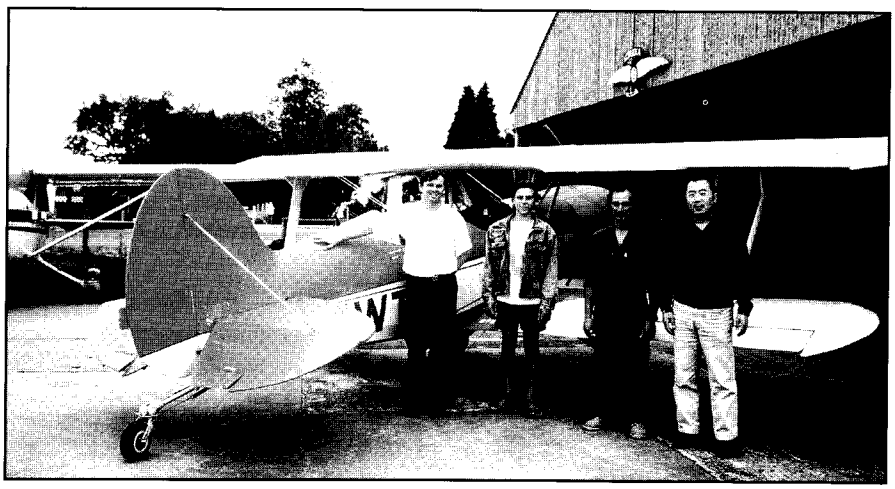
I have flown my Acro II and now have 32 of the 40 hour restriction flown off. This picture that I include is fairly recent. I made minor rigging adjustments to overcome a heavy wing, but other than that, the only thing I have done is add the wheel pants. They look much better with than without. A fellow Chapter member is in charge of paint trim and stripes.

Performance-wise, with the Lycoming 180 hp O-360 I cruise easily at 115-120 mph. Landings at our strip, (2500'), are approach at 80 mph, 1500 rpm, 500' descent. The tailwheel slightly preceeds the mains on touch down and then it slows down real fast. I'm thankful for that. I'm also thankful that it tracks straight, turf or pavement.

I received so much help from so many builders over 12 years that the only way I can repay is to help a fellow builder, and I'd be glad to do that. But he really only needs to do three things: 1) Stay with it. 2) Stay with it. 3) Stay with it! While you are "staying with it", practice those finger tip muscles, toe tip muscles, neck and eyeball muscles.

May we all meet at Pioneer in June '98 –

John Wing
R.R. Box 367
Highland, NY 13144



Vincent D'Ath caressing his New Zealand Acro I

CORRECTION TO THE CORRECTION!

September 27, 1997

Dear Bill:

Once again we have run afoul of the chord line/center line controversy on placement of the pull tabs for the drag anti/drag wires. Please see Acro Sport II corrections – your Newsletter, #58. The information on the plans is correct. The little drawing on sheet 13 Zone A-5, applies to both upper and lower wings and center section, and says the holes touch the center line of the spar. This is the correct statement. The only place where this is different, of course, is at the butt rib #1. The fitting is lowered as it shows on the same sheet in Zone D-1. In that case, the tabs go to the chord line. However, the designer reassures us that those that have built the aircraft with all the tabs on the chord line will find no problem. About half the aircraft have been built one way and half the other.

Personal regards,
Ben Owen, Executive Director,
Information Services
infoserv@eaa.org

An Afternoon With Paul Poberezny

by Matt Keveney,
1032 Norwood Ave.
Oakland, CA 94610

(as published in the October 1997 Chapter 29 Newsletter)

"*Excuse me!?* You got to meet Paul Poberezny? Are we talking about the same Paul Poberezny who founded the EAA!" . . . Believe it or not, yes I did. And I had so much fun I had to share the story with all of you. Let me explain . . .

A few months ago I began planning a long-overdue vacation. I wanted to go home, (to Grand Rapids, MI), to surprise my father on his 60th birthday. I'd planned to stay with my sister in Chicago and do a little catching up with my friends in the Midwest. It occurred to me that I was going to be just a few hours away from Oshkosh. Maybe I could drive up there and have a close-up look at the airplane I've been dreaming about . . .

About a year ago, I bought plans for an airplane called the *Pober Junior Ace.* This airplane is Paul Poberezny's modernization of the *Corben Junior Ace* designed sometime in the 1930s. It has a parasol wing, a tailwheel, an open cockpit, two side-by-side seats, Fairchild-like outrigger landing gear, and an 85 horse Continental under the cowling. I've been in love with this plane since I first saw the photos of it. The dream of giving Young Eagle rides in it has captivated my imagination ever since.

Now as far as I knew, the only flying airplane built from these plans was the prototype hangared at Oshkosh. On a whim, I called the information number on the back of my EAA membership card and asked if there was any way I could have a closer look at it. . . . Maybe I could even, (dare I ask), arrange for a ride?

After being politely transferred to a few different extensions, I finally ended up speaking with a very nice woman named Bonnie. She listened to my plea and answered, "Well, you're going to have to talk to Paul about that."

"Oh, yeah, *right!*", I thought. "How's *he* ever going to have the time!?"

But just as I completed that thought Bonnie said, "Hold on a minute, I'll see if he's in."

Well, he wasn't in, but after a few

rounds of phone-tag I was speaking to Mr. Poberezny. He assured me that he'd gladly show me the airplane. "Just call when you get to Chicago," he said. So I did.

I arrived at Oshkosh on May 19 at around 1:15 PM, about an hour ahead of schedule. Due to low ceilings and high winds I figured that a ride was out of the question. I was a little disappointed, but thought I'd at least get to see the thing. I might even get to shake hands with the founder of the EAA – that was probably worth the trip. . . . My disappointment was about to change!

The museum receptionist called for "Red One" on the radio, and a few minutes later I was shaking hands with Mr. Paul Poberezny – just a few feet away from the bronze statue of him.

He drove up in a Jeep, dressed in blue jeans and a plaid shirt. "All right, let's go have a look at the plane." I immediately knew that I was going to like this straight talking man. He's what my father would call a *"good ole' boy"*.

Our first stop was a hangar on the east side of the field. The *Junior Ace* shared space with a partially completed *Acro Sport* fuselage and a very nice Bonanza. Mr. Poberezny had to drop off a welding pressure gauge somewhere, so he left me alone to sit in the airplane, make silly airplane noises, and dream about flying this blue and yellow bird. (Mine will have to be red and yellow . . . but that's another story!)

He returned a few minutes later and happily answered all my questions. I mentioned something about the engine, and before I knew it the cowling was open and he was explaining everything in sight.

When I had taken all the pictures and asked all the questions I could, we hopped back in the jeep and took a short ride to another hangar. (Mr. Poberezny had some other business to attend to, so I got to tag along.) This hangar housed the EAA Foundation's P-51, F4-U Corsair, B-25 and a number of other classics. He showed me around, spoke to a gentleman working on an old *Stinson*, (. . . something about a tailwheel-lock cable), etc. I can never stand in such close proximity to so many old airplanes without being awestruck by the history they represent.

Our next stop was the *Aeroplane Factory* where two more Junior Aces were under construction. This is a magical place where Mr. Poberezny seemed to be most at-home. Again, he wouldn't let me leave until all my questions were answered:

". . . We use *this* fixture to drill those funny holes in the spar . . ."

"Yes, we used a bending brake to make these tail ribs. Here, take this sample with you . . . Don't forget to make this bend *here* – it adds a lot of strength."

". . . I know a guy who'll cut out all those fittings for you. He's got some kind of a computer gadget that does it – it'll save you a lot of work. Don't let me forget to give you his number before you leave. His name's Ken Brock . . . That's right, 'the gyrocopter guy'." . . . Etc., etc. etc. Every other question I asked resulted in Mr. Poberezny giving me an example piece to take home. I have a wooden aileron rib, a few miscellaneous bolts, a steel elevator rib, etc. not to mention the priceless books, phone numbers, etc.

We spent most of our time here. Nobody else – just me and Mr. Poberezny. It reminded me of my childhood, when my father patiently showed me how every part of our model airplane went together. I wanted to stay there forever, but eventually I *did* run out of questions. I somehow think Paul was as sorry to leave as I was.

We made a few more stops; his office was one. I briefly met the "Bonnie" I had spoken to on the phone – found out she was Mr. Poberezny's *daughter,* Bonnie. I also had the privilege of meeting Mrs. Audrey Poberezny. We even made a stop to have a look at his Harley Davidson! (Yes, it's a really nice one.)

In the jeep, between stops, I got to hear a few stories: He recounted his recent partial-gear landing of the Foundation's B-25, (the bent prop blades now adorn one of the driveways); talked about the planes he flew in the military; and even talked about his melancholy experience investigating the tragic death of Steve Whitman.

It was a most memorable afternoon, but it was also very familiar. I feel much the same way whenever I attend a Chapter 29 function. Clearly, the predominant attitude in the EAA comes directly from the top – the *very* top. The fun we have in the EAA doesn't come from *what we do;* it comes from *whom we do it with.* Airplanes have little to do with it.

ACRO SPORT II - Stainless Drag anti-drag wires complete with all hardware new unused. $800 OBO 630-961-1520.

SUN & FUN FORUM

Sunday, April 19, 1998
at 11:00 AM
(All Acro Sport, Inc. airplanes)

TENT #1

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