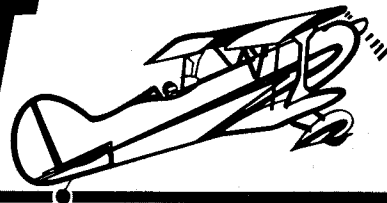


ACRO SPORT Newsletter

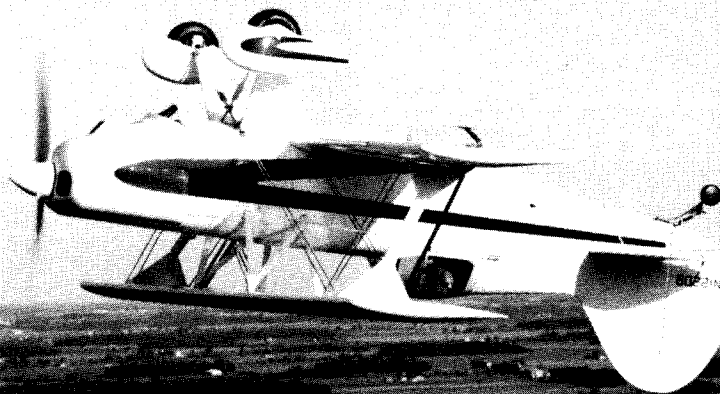


NO. 42

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JUNE, 1993

**Don Baker N122DB
2733 Whippoorwill
Elida, OH 45807**



Outside Loops in the Acro Sport II

At first the outside loop is quite uncomfortable, (painful) — Don Baker.

Will the Acro Sport II do outside loops? You bet it will! And it is capable of pretty good ones at that! For a long time I had the misconception that the Acro Sport II would not do outside loops well because of the high negative drag coefficient of the non-symmetrical, (M6), air foil. Although the M6 is not the best choice for outside maneuvers, I found that the outside loop really needs the same ingredient as any other maneuver, and that is practice, practice, and more practice. If you are interested in outside looping the Acro II, I have a few tips for you.

First let me say, that I really, truly enjoy doing aerobatics in the Acro II. Becoming proficient in aerobatics is a very rewarding exercise, and I find that practice sessions are the best part of flying. I really don't want to travel anywhere in my airplane, except maybe to a practice session or an air-show.

After flying N122DB for about three years, I decided that I couldn't be a whole person unless I at least tried an outside loop. So I decided to begin with the first half, which I assumed would be the most difficult part. I pushed up from full power level inverted flight into a half outside loop and . . . it worked! I was so elated with the accomplishment, and the relative ease of doing the half outside loop, that I just flew it off the top without finishing the second half. Another day for that; I

just soaked up the thrill of it and tried to remember what those negative Gs felt like . . . what a RUSH!

Lets take stock. My recording G meter showed about three negative. Red line is 4.5 so I still have some margin. And by the way, it seemed like the front flying wires were moving a lot during the push up. Was it my imagination or were they loose? Back on the ground, I found the wires were OK and figured it was just the excitement of that first attempt working on my mind.

A couple of weeks later, I decided to do the whole thing. I figured it would be relatively easy, because I had already done the hard part. I had given a lot of thought to the "over the top and down the backside picture" and it turned out to be harder than before. I tried five or six times, but I could not seem to get it up the first half of the loop. I tried various entry speeds and G combinations, but I kept stalling about two thirds of the way up. By the way, the Acro II easily recovers from this situation by hammerheading out and starting all over. What was so difficult about this first half? It seemed so easy the other day; I must have just lucked out. Finally, on the seventh try, I made it. I decided I wasn't going to waste the effort and I kept it going right over the top and down the second half. Wow, I made it, what a thrill! I am sure it was not a pretty one, but it was my first, and that was all that

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mattered. I had pushed as far as four Gs negative, and those front flying wires really were "flapping in the breeze"; it wasn't my imagination after all. A check back on the ground showed them to be properly tensioned, nothing seemed to have moved. Later, in talking with other pilots, I learned that this is not an uncommon occurrence with biplanes with two sets of flying wires. You just have to get used to it. I have.

I did not attempt many outside loops in the next few seasons, because I felt the airplane and wing were just too aerodynamically "dirty" to do good outside loops. It just seemed too hard to get it up and around that first half. I figured I just needed a better plane if I was ever to become proficient at outside loops. The only problem is, that another airplane is more money and more time; however, my desire to do outside loops just would not go away. So what's a guy to do? Here I am, not a whole person, unless I can get the outside loop mastered. The desire steadily grew.

Eventually, I decided that maybe I had not given the airplane a fair shake in this whole deal. Maybe it was me, not the airplane, who was at fault. Maybe I needed to acquire the proper "feel" of the outside loop. I seemed to have acquired it for all the other maneuvers which I liked, but not for the outside loop. At first, the outside loop is quite uncomfortable, (painful), and is such an alien situation that it is quite difficult to acquire the "feel". I decided pain or no pain, I needed to practice until it felt more normal.

I started by doing a lot of inverted entry hammerhead turns, and in this way I developed a feel for the first quarter of the outside loop. This now made attempts at the first half of the outside loop much easier and more consistent, however, still not perfect. So, gradually, the outside loop improved, but it still didn't feel just right. Finally, I decided that if I didn't practice the whole outside loop often, then I would never get the knack of it. So, I put it in my routine to force myself to practice it on a regular basis. It seems to have worked; now I can consistently get up the first half of the loop and the rest is downhill, (pun intended), although that downhill part is still the most thrilling part of the loop. Entry and exit altitude are also more consistent, and I can do them comfortably at 500 to 800 feet AGL. I am sure that they are not all perfect, but hey, practice makes perfect, and I am always looking for an excuse to go fly.

I guess the M6 is probably not the best airfoil, but it certainly is not the reason to give up outside loops in the Acro

Sport II. I do have a few hints though. First, the cleaner the airframe is, the better, I found that removing the front windshield and installing the front hole cover helps cut the drag a lot. Also, I found that the canopy helps streamline the airplane and reduces the drag quite a lot in outside maneuvers. Besides, with that front windshield off, the hole covered, and the rear canopy installed, the Acro Sport II really looks SEXY with its long nose and far aft located cockpit. Or as Mike Shade, (a friend who really gets around), says, "it looks like everything is dialed in perfectly on N122DB; it just looks right". Another bonus is that with the canopy, I don't need to carry along a cockpit cover for rain protection at airshows and fly-ins. To keep the cockpit cooler in the summer I cut a couple of vents in the sheet metal, Pitts style. Al Smith said they work great and he was right.

When flying the outside loop, use an entry speed of 160 MPH and initially push near four Gs, float very lightly over the top to keep it round, and use four Gs again near the bottom. It seems like a lot is going on and a lot of thinking and concentration is needed all the way around. Keep the wings level, bend your neck back to use the horizon as a reference as long as you can to keep it going straight and vertical during the push up. About two thirds of the way up the elevator pressure should be very light; too much will stall the wing. At this point, centrifugal force is effectively providing the lift and keeping the loop round. The airplane is now pretty slow but will soon begin to accelerate. As you approach the top a fair amount of right rudder is needed to counteract propeller gyroscopic yawing tendencies. You should have just enough speed and acceleration to float it over the top without stalling. Full throttle is used, of course, all the way around. The 200 horsepower with the 56 inch pitch prop is a good, (maybe necessary), combination for the outside loop.

After pushing three or four Gs negative in the Acro II, you gain much confidence in the structural integrity of the airframe. It is a new dimension which makes you realize that it really is a strong machine. Maybe that is because, initially, it feels so painful! But after a while you get accustomed to the feeling and it really doesn't hurt that much, it's just different. It is best to relax when pushing negative, don't strain like you would in a positive G maneuver.

If you are into aerobatics, try the outside loop; I think you will like it. It is a great confidence builder, and great fun!

Gene Chase enjoys a flight over Oshkosh, Wisconsin in the prototype Pober Super Ace.



Editor:
Bill Berrick
11803 Hunters Cove
Omaha, NE 68128
402/292-6832

Letters To The Editor

March 10, 1993

Dear Bill,

I have been flying my Acro Sport II for almost 7 years now, and have accumulated a little over 260 hours on the plane. I don't fly during the cold months, but try to get in about 50 flights per year. Typical flights are 30 to 45 minutes with an occasional loop and roll. I am more interested in "sport flying" than in aerobatics and haven't taken any long cross country trips.

From a maintenance standpoint, I have had no major problems. A crack in a stainless exhaust stack and new bearings in an automotive alternator are about the only real mechanical items involved.

Like a few other Acro Sport IIs I have seen, I have some cracks in the lower corners of the cowlings, near where the cowl joins the firewall. I stop drilled the cracks and added doublers of thin stainless behind the cracked aluminum as a repair. As I recall, even the original Acro Sport II at EAA headquarters had such cracks that had been repaired.

I have also had fabric cracking along both the front and rear landing gear tubes. Apparently, the fabric flexes enough to cause cracks in the dope finish. I think adding a rib between the gear Vs would help, especially if you then rib stitched the landing gear fabric in place. Another fix would be to go with a metal gear fairing, like on a Pitts. I noted a friend's Pitts even had a foam backing behind the metal gear covering.

Overall I am very pleased with the Acro Sport II. I looked at all of the two place biplanes on the market in the early 1980s and feel the Acro Sport is still best for a "sport biplane". I have had a few taller passengers comment that it is a little hard to get in and out of the front seat, but once inside, there is adequate room. This is typical of most small two place biplanes, however.

I hope this is the kind of information you need. I would be glad to talk with other builders, but it has been about 10 years since I completed some of the work, and details do get hard to remember.

Sincerely,
Steve Chace
2812 Grandview Drive
Bloomington, IL 61701
(309) 663-5938
N452, plan #632
150 Lyc, no
inverted systems

January 9, 1993

Dear Paul:

My love of flying began years ago when my father paid five dollars for my very first airplane ride. It all happened on a Sunday afternoon at a farmer's field near the small town of Elyria, OH. The airplane was a Waco biplane powered by a Curtiss OX-5 engine. The pilot's name was Tony Ross. Being a young boy, it was the most pleasurable experience of my life. Just to watch PCA, (Pennsylvania Central Airlines) Ford tri-motors fly over my home, or spend a Sunday at the local airport watching activities were special to me. Attending the Cleveland Air Races in the thirties, seeing the famous pilots of the day performing before huge crowds was something to behold. So, it was not unusual that I chose the aviation field as a career.

After retiring from the Air Force and moving to Maine, domestic activities became a bore, so I decided to build an airplane. My friends and neighbors no doubt thought this idea a bit unusual. However, my wife agreed with my idea, so I pressed on. After obtaining several plans, I finally decided on the ACRO II. The first kit was ordered in 1983, and as of now, I am in the covering stages using the Stits process. Hopefully, the first flight will be in the early spring or summer. Contacts have been made with the FAA, GADO office. I am most

EDITORIAL

by Bill Berrick

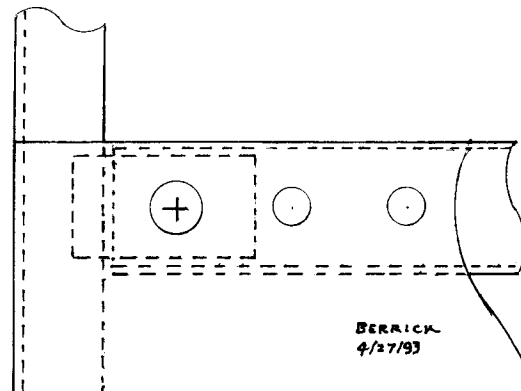
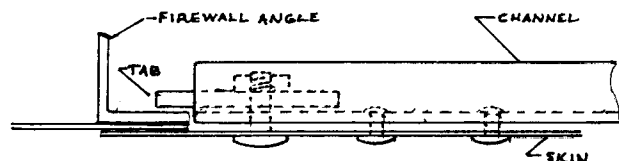
My Acrosport I developed a crack in the top part of the engine cowlings, close to the hinge line junction with the firewall. This occurred during a pull-out from a spin during an aerobatic sequence. The maneuver was not unusual for this airplane, but the crack was apparently due to fatigue from 80 hours of vibration and from the lift exerted on the top of the cowlings. The way the "eyebrows" of the cowlings curve out to clear the cylinders prevents tension support of the hinge line from below by the side panel. The hinge line raised about two inches above the aft cowlings line due to a two inch crack in the sheet metal, and I landed without incident.

While it is not shown in the Acrosport I plans, I think current builders should make an angle bracket to attach the aft end of the $\frac{1}{2}$ " x $1\frac{1}{8}$ " channel hinge support to the firewall, (Sheet 12.00). I didn't make them, therefore the aft ends of the channels were bound to the firewall only by the sheet metal skin.

An easy fix for the potential problem for completed aircraft is to remove the most aft rivet that attaches the hinge and top skin to the channel and replace it with a 1032 washer head screw. This is to attach an aluminum tab to the inside of the channel, which extends under the firewall aluminum angle and clamps the channel securely to the firewall.

I have since also added the same clamps to secure the rear ends of the lower channels that hold the camlocks on the side panels of the cowlings; (see drawing). The top capscrew hole in the sheet metal was showing hairline cracks

on both side panels. Apparently these are not uncommon on our Acro Sports; (note the letter from Steve Chace). If your cowlings has channels supported only by the sheet metal skin, suggest you take out a screw or two and check for beginning cracks!



An aluminum tab clamps the hinge channel of the cowlings securely to the firewall angle.

appreciative in regard to their help and support. FAA designees are in short supply in this area due to the high liability insurance factor. After final assembly and flight test, photos will follow.

Paul, enclosed is my check to cover renewal of the Acro Sport Newsletter, with a little extra to help with publications.

Col. (ret) Frank R. Schroeder
17 Dunn Street
Thomaston, ME 04861

January 23, 1993

Dear Ben,

Thanks for including my letter regarding the Acro II landing gear gussets in the Newsletter. However, a correction is needed. The sentence reading: "More important, it extended into the front gear mount," should have read: "More important, it extended into the flying wire mount". It would be bad enough to fold the gear on landing, but losing the flying wires could really spoil one's day!

Sincerely,
Thomas De Winter
209 Cedar Drive
Colona, IL 61241

February 20, 1993

Dear Bill,

My Acro Sport, Serial #1007, N287RC, was signed off by the FAA in 1990 after 2½ years and 2600 hours of building time. During the building, my contacts with EAA were a tremendous help. They answered questions at any time I needed help. Ben Owen was especially helpful, and the plans were very good.

I used the Stits process to cover and paint, and installed a Lycoming O-360A4M with only 460 total time since new.

After solo flight, I had to increase the

angle of attack of the horizontal stabilizer to two degrees. This made handling much better.

When I had 50 hours on it, I had to sell it since I lost my medical. The new owner is:

Paul Whittaker
R.D. #3, Box 25
New Alexandria, PA 15670

Paul keeps his own grass strip and flies it all the time. I am sending you a picture of N287RC after 30 hours of fly-off time.

Sincerely,
Bob Cunliffe
26632 S. Queen Palm Ct.
Sun Lakes, AZ 85248

January 21, 1993

Dear Paul,

My mother and I really appreciate the memorial to my dad, (Bob Williams), in the December 1992 issue of the Acro Sport Newsletter. However, things are a little distorted in what was evidently reported by another (well meaning) chapter member, and we would like to correct them for you.

Dad was a very cautious pilot and would never fly if he thought there was any doubt about his physical well-being. He had accumulated over 14,000 hours and was revered by all pilots who knew him. Many aircraft owners had commented that he was the only pilot they would trust to fly their aircraft without them in it.

Dad awoke and felt fine the day of the accident, and had gone to church with Mom in the morning, (while I was out flying the plane). I stopped by their home at about noon on my way home from the airport, (I live in a town about forty miles away), and talked for a few minutes. At about 12:30 Dad went to the airport to meet a fellow who wanted

to see the Acro Sport II, (and was thinking of building one). Dad didn't fly, but went home after showing and talking about the airplane. He told Mom that he had a stomachache, went into the bathroom, and when he came out, laid down on the bedroom floor and fell asleep for a couple of hours.

After awaking, and his stomach feeling better, he and Mom went out to dinner. After dinner he told Mom he wanted to go to the airport and fly — wanted to work on the 40 hour restriction, (of which about half had been flown off), so that we could take the airplane to the annual State EAA Fly-In at Heber, Utah in September. He dropped Mom at home and went to the airport. He took a 15 year old grandson with him to the airport, who sat outside of the hangar while Dad flew. This grandson has stated that there was no indication from Dad of any physical problem prior to the flight.

Witnesses at the "practice area" where the accident occurred have stated that "he was really wringing the airplane out — going from one maneuver right to another". He was performing loops, rolls, hammerhead stalls, etc. However, only one witness, (a non-pilot), actually saw what Dad was doing immediately prior to the diving spiral. She stated that he was "just flying along and then just went down". Other witnesses, including one student pilot, did see the diving spiral, and said there was no attempt at recovery, indicating that Dad was obviously incapacitated — for whatever reason.

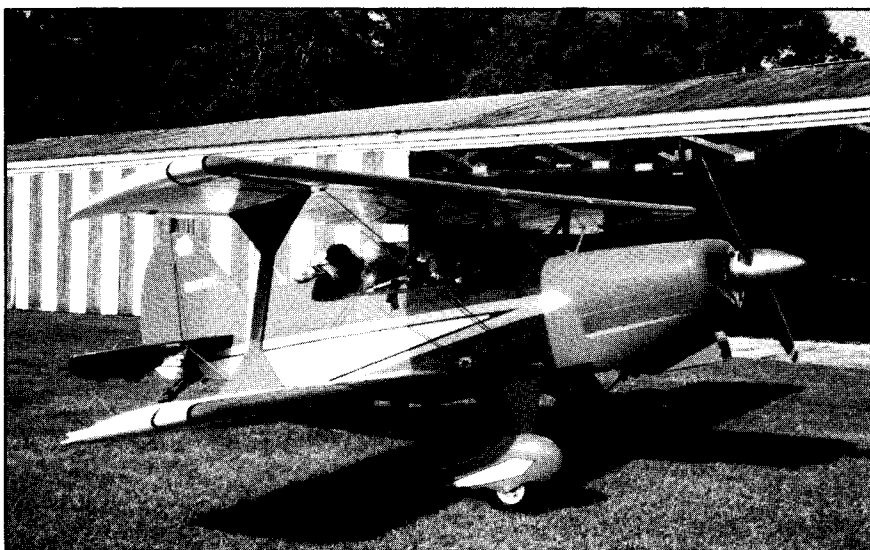
After reviewing an FAA Advisory Circular about the effects of G forces, we are almost certain that Dad had lost consciousness due to G forces. Several of the cases cited in the circular sound almost identical to what had happened with Dad.

I am sending a copy of the advisory Circular, (AC No. 91-61, dated 2/28/84), with hopes that you will remind all aerobatic aircraft builder/flyers of the potentially serious physiological effects of G forces.

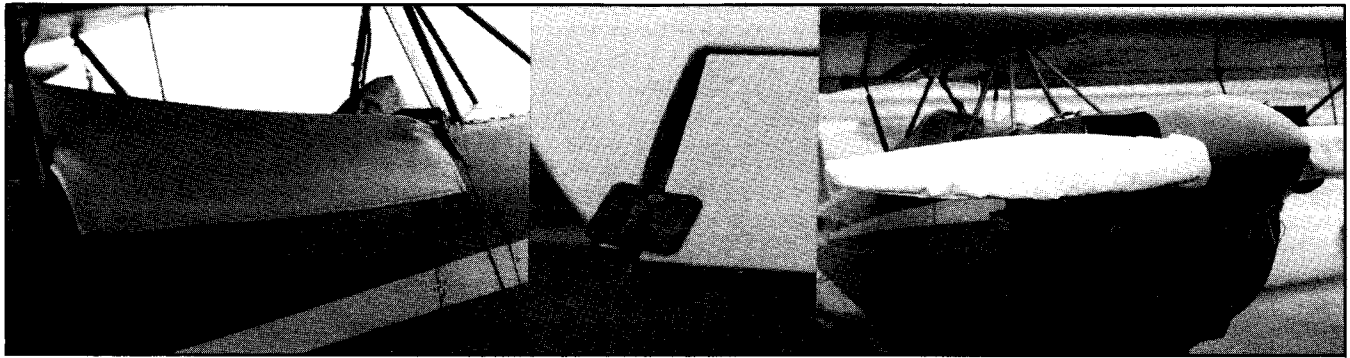
Dad and I enjoyed very much building the Acro Sport II together, and were very proud of it. Unfortunately, we can't bring Dad back, but we can build another airplane, and that's what Mom and I are now preparing to do. Another Acro Sport II, just as much like the first as possible — it was a really fun, easy to fly airplane. We are very proud to be EAA members and were equally proud of our Acro Sport.

If you would like more information, please feel free to call or write.

Rand W. Williams
3829 W. 5800 S.
Roy, UT 84067-9179



Bob Cunliffe completed N287RC in 1990; now owned by Paul Whittaker.



March 9, 1993

Dear Acro Sport Newsletter:

I completed my Pober Pixie in 1985, and am now approaching 200 flight hours. I always enjoy reading the Newsletter and learning tips from other builders. I would like to share my tips on how I "care for" my Pober Pixie which is not kept in a hanger, but tied down on the airport ramp.

My rationale for keeping the plane outside is economic. With hangers in this area costing around \$85 per month, and tie downs costing only \$15, a little more than a year's savings from parking outside would pay most of the cost of recovering, (excluding labor). Another rationale: does it make sense to pay \$1000 per year to shelter a low cost airplane? That's an individual decision, but considering the weather in southwest Idaho is fairly benign compared to other sections of the country, I opt to save the money.

After five years of being outside during the spring, summer and fall, my plane has never suffered any weather damage. The only thing I really worry about is hail. It's survived wind gusts of more than 60 MPH during spring thunderstorms and heavy rains. I am careful to keep all drain holes unplugged, and try to keep everything waxed. During construction, I used good quality paints and varnishes, and put a preservative inside the steel tubing.

Once it becomes too cold to fly, usually around the middle of November, I remove the wings and store the plane in my garage for the winter. This gives me a chance to do a number of little maintenance items. Once the weather warms up, usually in April, the plane is reassembled for another season of flying.

Here's how it's tied down. I park the plane into the prevailing winds; this takes a lot of pressure off of those full span ailerons during wind storms. I place small aileron locks at each wing tip and wire them to an aileron hinge. This keeps the locks from working off when the wind causes small aileron movements. I wire the control stick in



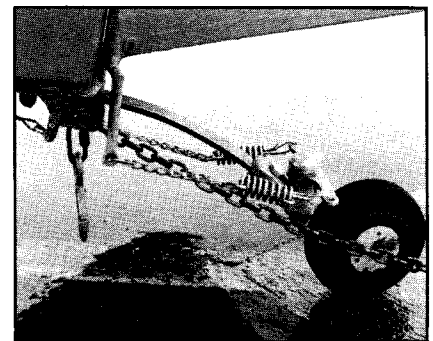
Top/left — Handy and efficient cover keeps cockpit dry and provides a measure of security. **Center** — Simple to make aileron locks secure control surfaces even in strong winds. **Right** — Wax and these covers keep the Pixie prop shiny and new looking. **Above** — Thompson's Pixie is still a beauty after five years on the ramp in Idaho weather. **Below** — A glider tow hook like this one installed on the Pixie could save your life while hand propping!

place using a piece of safety wire between the fuselage and the stick. And, of course, tie the wings and tail down with chains provided by the airport. I welded a tie-down ring on the front lift struts.

Keep the propeller waxed and covered. My prop covers were made from tonneau covering material purchased at an automotive upholstery shop. Cover the cockpit area using tonneau cover cut and sewn to fit the various fuselage contours. A large boot lace tied to the wing strut holds down the front of the cover, and velcro around the turtle deck holds down the back.

I found the rain water will run down the aileron control tubes and accumulate inside the control horn. To alleviate this, I drilled a small weep hole at the low point on each side. This allows the water to run down in the fuselage and out the drain hole by the tail spring.

One option I strongly recommend to everyone is a glider tow hook bolted to the tail spring. This is used to hold the plane securely in place while hand propping the engine. A release is installed under the seat. There have been several occasions when the engine



proved hard to start, and knowing the plane won't move once the engine does start is a great safety feature.

I would like to thank the editors of the Acro Sport Newsletter for the fine job they do, and would like to hear from more Pober Pixie flyers and builders in future issues. Anyone interested in more information is welcome to call or write; home, (208) 343-7834, or work, (208) 334-2470.

Sincerely,
Lloyd Thompson
2151 White Pine Place
Boise, ID 83706

January 27, 1993

Dear Bill,

Thanks for your letter concerning my "Pixie," (see Sport Aviation, February '93, What Our Members Are Building).

No, it wasn't a "hands off" thing. A lot of adjusting to offset the Continental 85 with a cruise prop. Climb is great! 1000 fpm, cruise at 90 mph, lands 60-65 mph — lots of floating without flaps. Top speed is 115 mph @ 2500 rpm. Senenich prop is 72x48. Weight and balance was tough; with starter, mag, battery, and generator it needed 18 lbs. aft.

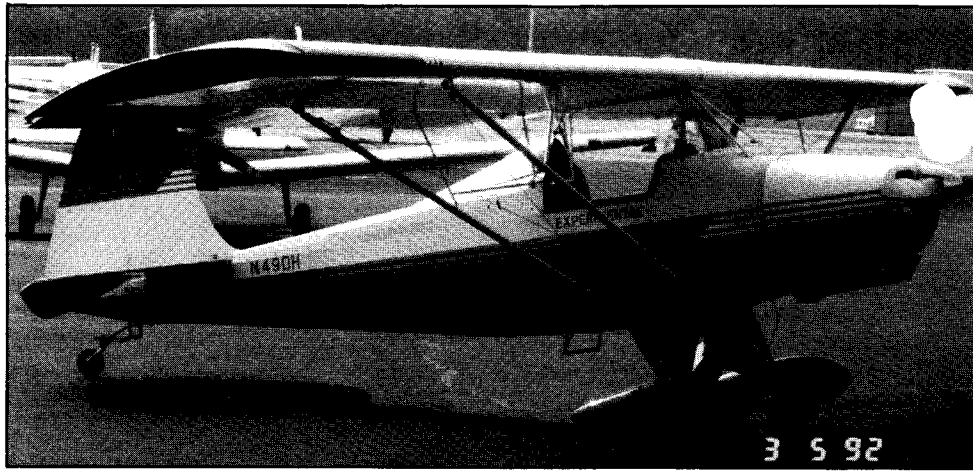
Blast of air is something I'm not used to. I've extended the windscreen to some extent and has helped. Any ideas?

Enclosed are pictures you will be interested in. As you can guess, the engine runs cool as well as the whole engine compartment. Note the blast tubes for the mags and the generator. Radio is the "Sporty". See the mike button on the stick; the ear phones are not shown. Antenna is between the gear legs. I get very good reports on the radio quality.

In closing, I'm proud to say that I placed 2nd for a first time builder at a fly-in at Brookhaven-Calabro Airport, Long Island, NY sponsored by The Antique Aircraft Association of Bayport, NY. I was thrilled!

Thanks again for your interest,
Don Hollister
918 Stratford Court
Westbury, NY 11590-5823

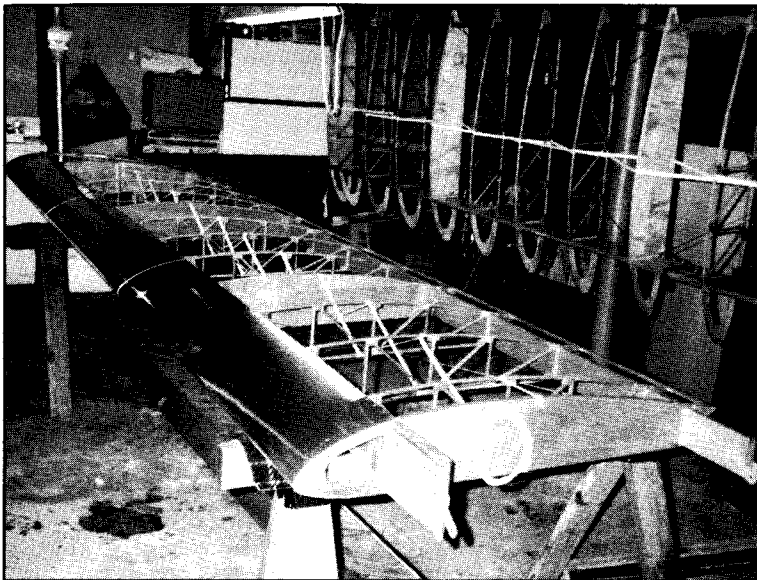
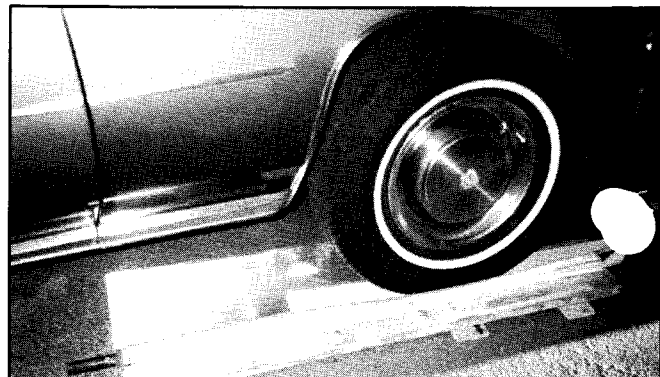
Editor: My answer to the open cockpit wind blast was a David Clark headset and their cloth helmet made to fit the headset. I don't notice the wind if I can't hear it, except on the back of my neck in cooler weather. Then I add the fur collar on my "bomber jacket".

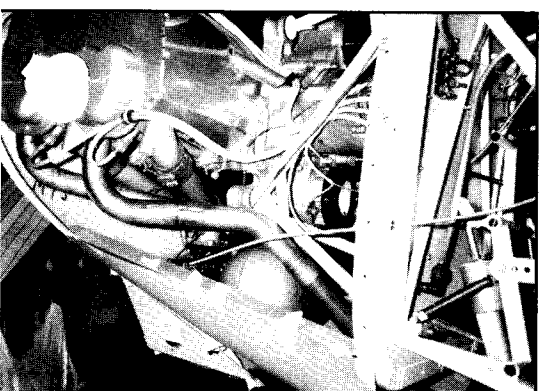
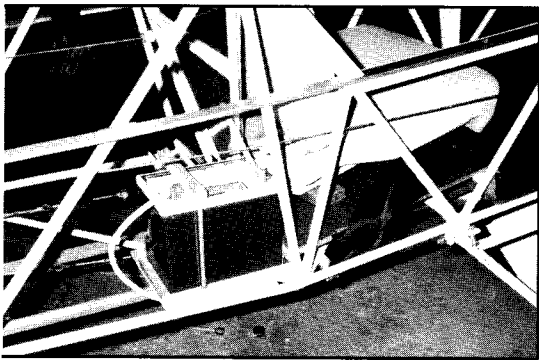
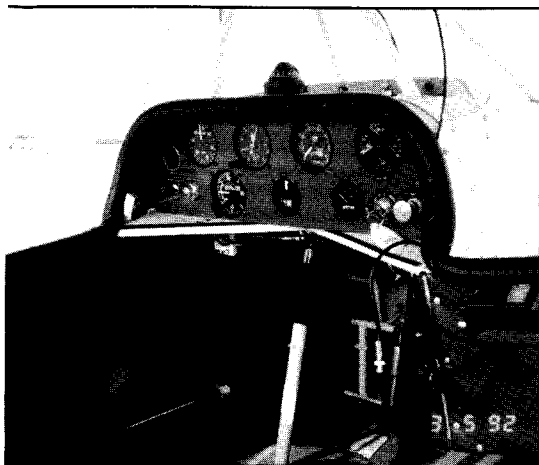


Above — Don Hollister's Pixie placed 2nd for a first-time builder at Brookhaven-Calabro Airport, Long Island, New York. Aircraft weighs 678 lbs. and cruises at 90 mph. Top speed is 115 mph. Right — A proud builder and his beautiful Pixie!

Right/Below — Bending Pixie leading edges with a home grown two-ton press. A very simple solution to a problem that can be quite frustrating for many home-builders. Auto jack insures complete control throughout bending process.

Left/Below — Completed wing panels display excellent workmanship and are shown here ready for cover.





Top — Neat panel and spacious cockpit of the Pixie. Note hand held radio installation mounted on door. Center — Weight and balance required an additional 18 pounds aft, necessitating installation of the battery behind the pilot's seat. Below — Engine installation is a Continental 85-12F with starter. Note blast tubes to cool mags.

Horsepower vs. Aerodynamic Cleanup

Condensed from Neil D. Bingham, P.O. Box 16884, NW Sta., Salt Lake City, UT 84116, writing in the KR Newsletter No. 189.

Will a bigger engine be worth the price and weight for more speed? Neil offers the classical formula for calculating top speed: Max speed = K times (the cube root of HP divided by total wing area). K is a factor which embodies aerodynamic design including parasitic and induced drag.

Increasing the HP or lowering the wing area, (clipping the wings), increases the top speed, but not as much as cleaning up the parasitic drag and/or choosing an airfoil that is more conservative of lift at higher speeds. The latter

at the expense of longer take-off roll and higher landing speed. Notice that HP and wing area are inside the radical and affect speed only by the cube root, while the K factor is outside the radical and has full one time effect on speed. Try the fairings first!

'93 FORUMS

Acro Sport I and II — Monday, August 2 — 11:30 a.m. to 12:45 p.m. — Tent No. 8.

Pober Super Ace, Pober Jr. Ace, Pober Pixie — Tuesday, August 3 — 11:30 a.m. to 12:45 p.m. — Tent No. 8.

AWARDS DINNER

Monday, August 2 — Robbins Restaurant. 7:00 p.m. cocktails — no host dinner 8:00 p.m. awards to follow.



Wicks Aircraft Supply

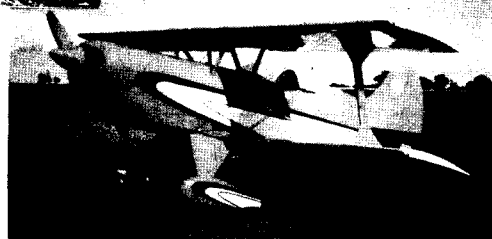
P.O. Box 129 • 410 Pine Street
HIGHLAND, ILLINOIS 62249

618-654-7447

ACRO SPORT II KITS



POBER PIXIE BASIC KITS



ACRO SPORT KITS

FOR MORE DETAILED INFORMATION PLEASE CONTACT..



Wicks Aircraft Supply

P.O. Box 129 • 410 Pine Street

HIGHLAND, ILLINOIS 62249

618-654-7447

AUTHORIZED ACRO SPORT DEALERS

As reported in the September 1992 issue of SPORT AVIATION, Alexander Aeroplane Company, P.O. Box 909, Griffin, GA 30224 (1/800/358-5228) and Wicks Aircraft Supply, 410 Pine St., Highland, IL 62249 (1/800/221-9425) are authorized suppliers and dealers for materials and supplies for Acro Sport aircraft. When ordering, state the type of aircraft materials needed — Acro Sport I or II, Pober Pixie, Pober Super Ace, Pober Jr. Ace and Nesmith Cougar I.

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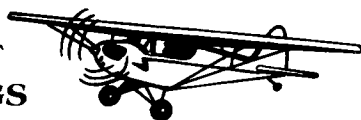
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