ACRO SPORT Newsletter

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Kurt Schwabauer's Mile-High Acro Sport II

On June 16, 1994 I took AcroSport II N45KS for her first flight. It took three years and 2400 hours of construction time.

I started with a project begun by a deceased builder, and stripped it back to the bare fuselage weldment. I sandblasted it to remove the rust and started all over. This became a true family project with my father helping and providing expertise from his aeronautical engineering background, and my mom helped with covering and rib stitching. My good friend Bill Rickman helped with masking for painting. My wife Marian was a great help by consistently providing me with the time to do the work. The plane is named for her.

The plane is built to the plans except for upping the engine to a larger 200 HP Lycoming IO-360A1A, and adding a seven gallon auxiliary fuel tank aft of the main tank to accommodate the higher fuel consumption. I fly at higher altitudes, and my field elevation is at 5200 feet. The added power comes in handy! (In fact, it was built in my shop which is located at an altitude of 8000 ft. MSL). It is also equipped with an electrical system for lights and basic avionics.

The first flight was perhaps a bit more exciting than I would have liked, with the engine temperature reaching redline. This was a problem which proved to be very persistent. The oil cooler location and air ducting was moved several times, including an air scoop added under the chin and mounting the cooler directly against the inlet. The problem was finally traced to an engine oil cooler bypass valve which was not opening fully.

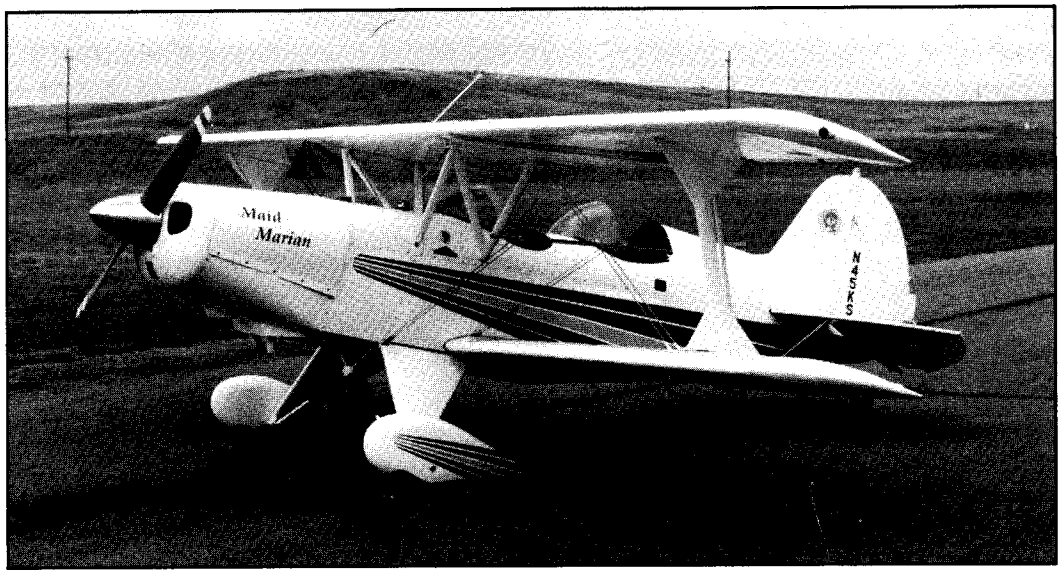
I also blew a brake line where it routed inside the gear leg covering. That required cutting away the fabric and replacing both lines with flexible hose. I replaced the fabric cover with removable aluminum gear leg covers.

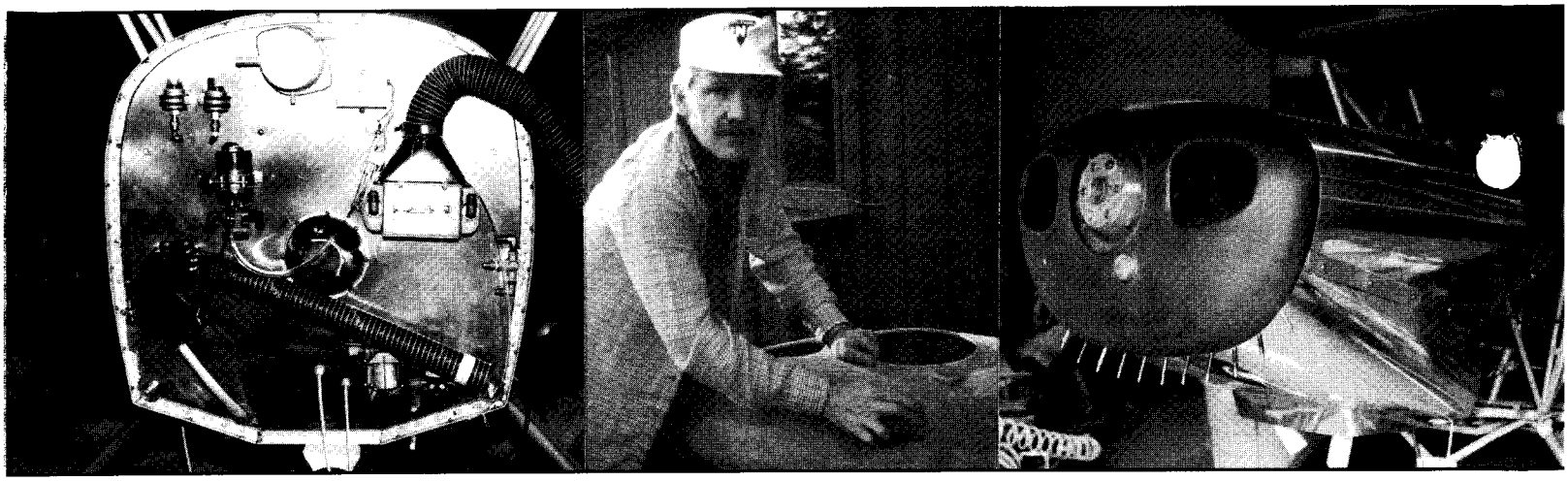
Rigging has been a challenge to get the airplane to fly hands-off. Because of the larger engine, this has to be a compromise. Changes in power setting also make big changes in the way she flies. I may just give up and add a trim tab or two.

After three months of tweaking and 15 hours of test flying, including some basic aerobatics, N45KS is flying fairly well. It is put away for the winter now, but I'm looking forward to continuing to improve the performance in the Spring. She's an honest airplane, forgiving on the ground and responsive in the air.

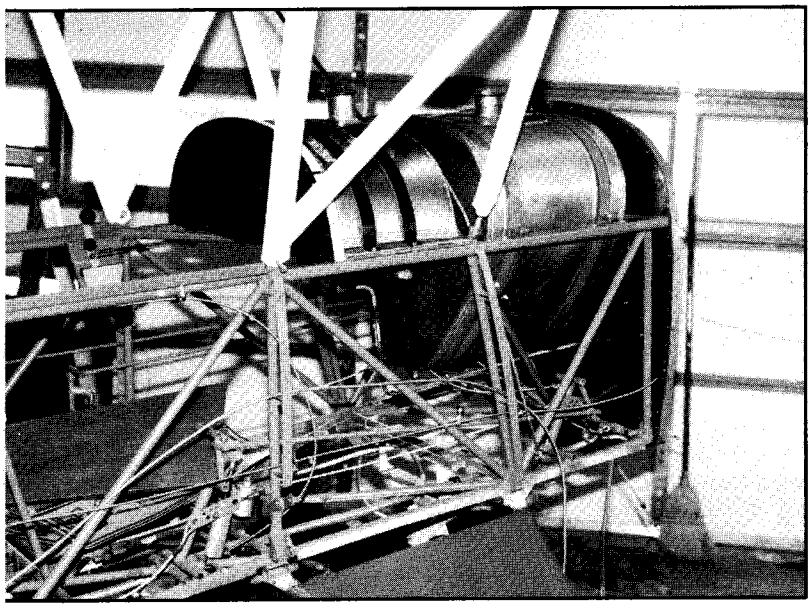
The only thing I think I would do differently if I could would be to pick a different covering system and a simpler paint scheme. It sure is pretty and I get lots of compliments,

Kurt Schwabauer's Mile-High Acro Sport II





ABOVE - Stainless firewall - Kurt making his own nose bowl to clear the IO-360 - Professional results on nose and cowling! BELOW - Aux tank adds fuel capacity for that big engine.



but it's six colors and two different types of paints, enamel and dope, which meant twelve different painting operations. I got awful tired of cleaning that paint gun!

After sitting out this winter on the ground, I think I'll go ahead and add a bubble to the rear cockpit. I love the open wind-in-the-face flying, but it's only warm enough for that 1/2 of the year. I'll need to cover the front pit with a tonneau snap-on cover too. What I need to do is to figure out how to make the bubble a quick removal mount so I can take it on and off as the weather dictates.

I've finally fulfilled a dream instilled in me in high school 30 years ago by my father, an EAA'er from way back. To those of you who are working on projects now, hang in there, it really is worth it.

See you at Oshkosh in 1995!

SPECIFICATIONS
Plans #1329
Empty weight 1090 lbs. with 73 lbs. on the tail wheel.
Prop is Sensenich 76x58; I think I could use more pitch, static RPM is 2900.
Climb is estimated 800 to 1000 FPM from field elevation of 5200 MSL.
Cruise is about 110 to 120.
Battery is behind seat for CG.

Covering aileron leading edge mounting points added

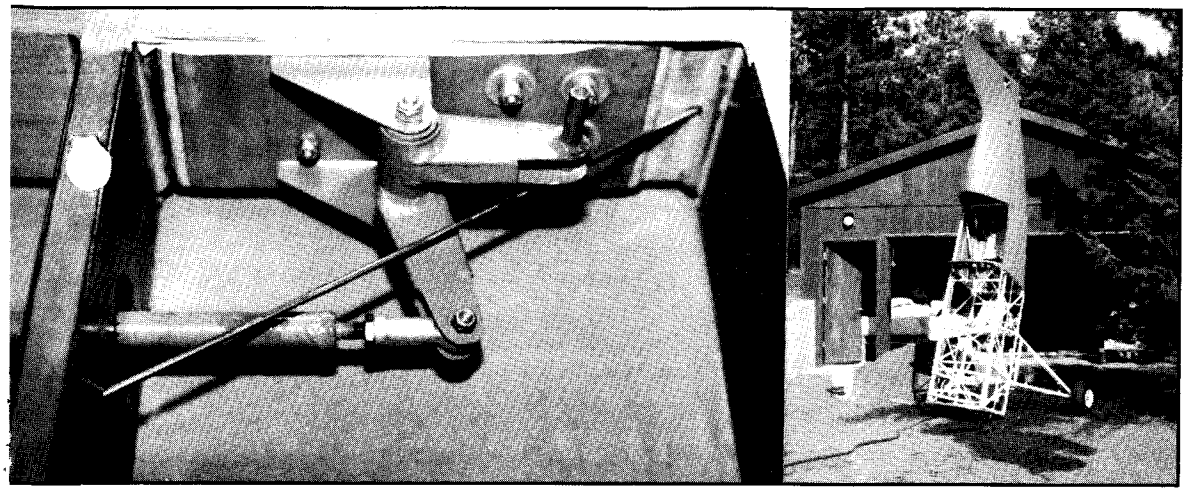
EDITORIAL/by Bill Berrick, Editor

Some good tips on propeller selection are included in this Newsletter, thanks to a presentation by Chris Heinz in 1977, and to Ben Owen for digging the article out of his files. We are also including a listing of suggested props for all of our airplanes from Sensenich.

The choice of propeller for my Acro Sport I was made on a less scientific basis, but it seems to have worked out well enough. A friend of mine who was moving decided to clean out his garage and get rid of some heavy stuff rather than paying for moving still another time. It included some lead ingots, old bed rails, and a propeller that was removed from his Grumman after a student taxied into an open trench and dinged the tips. He gave the whole lot to me, having noticed such things as an old washing machine gear box and a rusting reel-type lawn mower among the things I was saving for some possible future need. I've used the lead many times for weights as well as for casting elevator and rudder counterweights for my GP4. I still have the bed rails if you are looking for a pair.

I took the prop, (a 73" McCauley), to our local prop shop to see if it should be salvaged or used for a mantel piece, with the result that the tips were trimmed and it was overhauled to better than new condition for about $250! It was now 70" x 57" but still within the type certificate specs for that prop.

The Acro I plans call for a 74" x 53" Sensenich for 150 or 160 H.P., (mine is 160 H.P.), and 76" x 56" for 180 H.P. The 100 H.P. Continental model used a 69" x 50" McCauley. Early on I thought I might increase the pitch to try to keep up with the Swift formation but when Olie Pash "wrung it out" for the aerobatic maneuvers that I wasn't up to, he thought less pitch, if anything, would be better. I could no doubt use a longer prop in the future, but for now I concluded that it was just right for me.



FAR LEFT - Precision work on bellcrank.
LEFT - Unusual attitude at 8000 feet MSL.

nine MPH and 100 FPM climb! I'll try to gap seals next Spring.

The elevator stick pressures seem heavy to me; anyone else have that problem?

I went through a couple of engine choices before settling on the IO-360 and have a conical mount for a Lyc O-320 for sale for $300 or a dynafocal mount for Lyc IO-320 through IO-360 Type B for $400.

Kurt Schwabauer
6678 Marshmerry Lane
Evergreen, CO 80439

Propeller Selection for Light Aircraft

From a talk given by Chris Heinz to Canada EAA Chapter 41 on November 7, 1977, originally published in the Chapter 41 Newsletter.

The price of a constant speed prop is approximately three times that of a fixed pitch prop, and cannot be justified by the increase in performance, (nothing in cruise, and about 5% during takeoff and climb).

The larger the diameter of the prop, the better for takeoff. The diameter is limited by:

(a) GROUND CLEARANCE—
Ground clearance should not be less that 8" to 10" with properly inflated tires and shock struts, with aircraft in level flight attitude.

With flat tire and deflated strut, (nose wheel for tricycle undercarriage aircraft, main tires for tail wheel aircraft in lift off configuration), prop should clear ground by about 1 or 2 inches.

Up to speed of 30 MPH at full throttle, sand and stones are "sucked up" into the prop arc, and will damage the tips. Therefore, when the ground clearance is less than 12", it is best to accelerate to 30 MPH at low RPM, (say under 1500), and then to gradually increase RPM as forward speed builds up. This is because after reaching 30 MPH, the forward speed of the aircraft is such as to prevent stones from being drawn into the prop arc, thereby reducing propeller damage.

(b) TIP SPEED--When the prop tip speed is over 75% of the speed of sound, (1100 fps at standard temperature and pressure), the propeller efficiency drops sharply and noise increases. The propeller diameter in inches should then not exceed 0.75x1100x60x12 divided by TI x RPM, (or 189,000 over the RPM). Thus for a 2500 RPM engine, the max prop diameter should be about 76 inches. Variations due to altitude, temperature, pressure and forward speed have been neglected in this simple calculation. This maximum diameter should be checked with :

1. Full throttle, climb speed RPM
2. 75% cruise RPM at low level, (below 3000 ft.).

(c) SELECTION OF THE BEST FIXED PITCH COMPROMISE PROP
Once the maximum diameter is selected based on ground clearance and tip speed limitations, other variables to be considered are the pitch and planform, (shape), and profile of the propeller blade. Usually, shape and profile are fixed for a certain prop and cannot be altered. The pitch should be adjusted to obtain the following optimum compromise:

1. Run-up at full throttle, on the ground, no wind, should result in an approximately 0.8 of the redline RPM, (2200 for redline of 2700). When this RPM cannot be achieved, it indicates that the engine is over-torqued, which if allowed to persist, will result in engine deterioration. As a rule of thumb, decreasing the prop diameter by one inch or decreasing the pitch by one inch will increase the RPM by approximately 80 RPM. It is advisable not to cut down the prop diameter too much, as it is quite impossible to take off with a four foot propeller fitted to a 180 HP engine!
2. During cruise in level flight at full throttle in calm weather, at low altitude, (say 3000 ft. max.), engine RPM should be 5% over the redline RPM, (i.e. 2850 when redline RPM is 2700). Note that for short periods, (say three min.), it is not detrimental to the engine to run even up to 10% over the redline RPM.
3. The propeller selected to result in 80% of redline RPM on the ground and 105% in the air, at 75% power will cruise at about 93% of redline RPM, (2500 for 2700 redline), at low altitude.
4. At 8000 ft. altitude at full throttle, the RPM will be redline RPM. During climb at 75% power, the RPM will be close to .85 or .90 of redline, (2300 to 2450 for a 2700 RPM engine). The only way to be certain of the

horsepower developed is by means of a manifold pressure gauge and the power curves supplied by the manufacturer of your engine.

5. A climb prop usually has a larger diameter and finer pitch, (and different shape), than a cruise prop such that peak occurs at the proper climb speed of the aircraft/engine combination.

It is improper to compare props from various manufacturers considering only their pitch, as the reference by which the propeller pitch is established is different for different manufacturers.

Wood and fiberglass, being fibrous materials, will cause fibers to "slide" over one another under stress, and therefore absorb vibrations better than non-fibrous materials. Therefore, wooden propellers are quieter than metal props.

Multi-blade, (more that two), props are almost always used for ground clearance reasons. They are expensive and usually do not improve performance but only the "look".

SOME OF THE ADVANTAGES AND DISADVANTAGES OF WOODEN PROPELLERS ARE:

If prop strikes the ground, in 95% of instances no damage to crankshaft results, but irreparable damage results to the prop, (at much less cost).

Wood absorbs moisture which causes an imbalance. Thus wooden props require more maintenance. Noted that to reduce the possibility of imbalance, wooden props should always be left in the horizontal position.

Wood props may lose as much as 1/4" of the leading edge if flown for one hour in moderate to heavy rain. This damage can be reduced by recessing, (for aerodynamic cleanness), 0.020 to 0.025 inch thick metal leading edge cuffs onto the prop.

Wood props are made of hardwood, which has poor adhesion properties as far as the more durable finishes, (epoxy, etc.), are concerned. Therefore, propellers are frequently varnished. This finish must be maintained.

Wooden propellers, being more elastic than metal props, do not have as wide a high efficiency range as the metal ones. However, for a given selection, (e.g. optimum takeoff, or optimum cruise), their efficiency at that optimum condition is as good as a metal prop. Thus, for an optimum takeoff prop, a wooden prop will result in about 5 MPH speed reduction at cruise when compared with a similar metal prop. Similarly, an optimum cruise prop will result in about a 5% increase in takeoff distance compared to metal props.

Chris Heinz is President of Zenair Ltd., Huronia Airport, Midland, Ontario, L4R 4K8, Canada. Zenair manufactures airplane kits but no longer makes wooden propellers.

Letters To The Editor

March 19, 1995

Dear Bill,

Re: Acro II

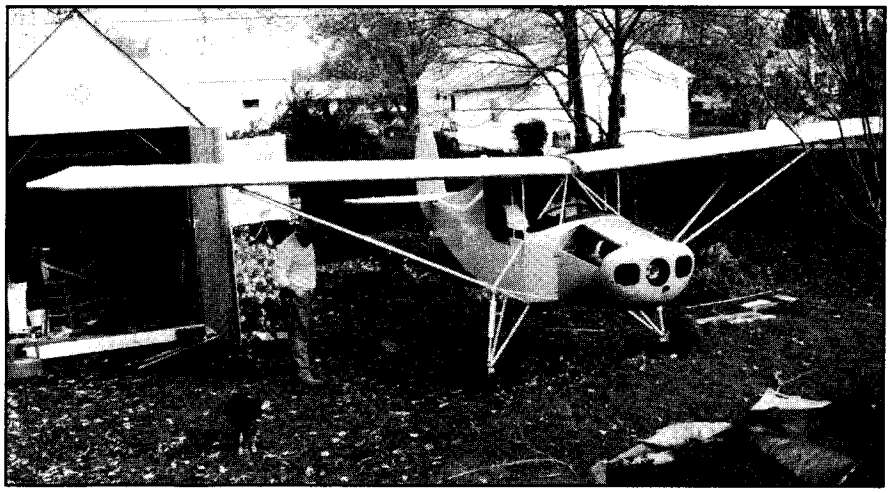
Sometimes the simplest things whiz right by me. For some time I've been trying to figure out how everyone gets the fairing under the gear to hide the brake lines without extending a foot under the fuselage. Even looking through hundreds of pictures taken at Oshkosh of every Acro II I saw gave no clues. The fairings were always in place.

The detail drawn on Sheet 8, A-2 of the "Pink" (by now grungy pink!), plans shows the AN837-4D fitting orientated at 90 degrees to the channel. Of course one doesn't get this far into the project without realizing that not everything works according to plans. Nevertheless, I blindly set the fitting as shown, (this was relatively early in the project). Months later, (OK, years later), I had the bottom skins mounted and it still looked as if the hoses would stick out under the fuselage, not to be hidden by the fairing. Well, I didn't need to have the hoses connected, so I put off cutting the hose slots in the bottom for later - much later.

The time finally came when I had to resolve this problem. Even after looking at the plans drawing of the bottom skin, I still didn't get it. And why did they show the slots cut on an angle? They even showed dimensions! Well, anyone could see that the plans were wrong. It didn't feel right, but I was at one of those "do something - even if it's wrong" points. I cut a clearance slot for the right side. Yep, I was right. The slot extended six inches into the piece to give clearance. Oh well, it has to fit. I cut the two slots in the left side. And then the lights came on, You Idiot! Now I was at one of those "you better walk away for a day" points!

Simply by rotating the fittings to point aft, the hoses can be aimed to just clear the bottom longeron. They will have very little motion as the gear works through its range of travel, and the fairing will easily hide them. My beautifully crafted bottom panel is now scrap. I did salvage the back half and made a new section to cover station 2 to 3. Oh well, it will be easier to service with the panel in two sections.

Best Regards,
Tom DeWinter
305 E. 11th Avenue
Coal Valley, IL 61240
(309) 799-3544



Lee Thomas' Junior Ace nearing fly-time!

February 15, 1995

Dear Jean,

Thank you for the invitation to participate in the Acro Sport Forum at Sun & Fun. I would like to be part of it. I have not been to Sun & Fun yet and planned to go this year. My Junior Ace is about 95% complete and will probably fly late this summer. There is a picture enclosed, not a very clean picture, but you get the idea. That's me "flying"; my dad is co-pilot with Rick Heckman and Katie looking on. Please send me a note, or call some time to explain the possible agenda for the Forum, what should I bring, etc.?

Lee H. Thomas
Technical Counselor/A&P
EAA Chapter 240
29 Stevens Ave.
New Castle, DE 19720

April 24, 1995

Dear Bill:

I have attached an article by Chris Heinz that I think gives good information on propeller selection for sport aircraft. I do not know if it is suitable for aerobatic planes. In the past, our aerobatic friends have considerably overspeeded their Lycomings, particularly fixed-pitch prop — 180 HP and 200 HP — when on a decline. According to Chris's guidelines, 2900 static is excessive. Please see the attached article by Chris.

Our suggestions for the Acro Sport II have been the same as for the Acro Sport I, and these propeller sizes seem to have worked well for both aircraft. It never was published on the Acro Sport II plans. I am sure that insufficient experimentation has been done on the propellers. You are probably aware that Sensenich did some experimentation and does have a propeller for the Acro II. Maynard Engle of Parksburg, PA worked with Sensenich on this. The resulting prop is the Sensenich 75/58 on the O-320. The Sensenich Corporation is located in Lancaster, PA. The gentlemen we dealt with were Robert Bistol, propeller engineering manager, and in particular, Joe Moss and Ed Zircher, telephone 717-569-0435. I think any one of those three people will be able to give you information on metal props available from Sensenich that would be suitable for the Acro Sport.

The wooden Sensenich propellers are now made in Florida, (Don Rowell, 813-752-3711). The wood prop is much lighter and easier on the crank for aerobatic maneuvers.

One nice thing about a standard category propeller on a standard engine is that you only get the 25 hour vs the 40 hour test period. Changing from one type of propeller to another is a major change that invalidates your special airworthiness. Then you have to go back to the FAA and get a new special airworthiness, another inspection, a new set of operating limitations, a new test area, and all. If you have a fairly minor change, you might call the FAA and ask if they consider it to be a major change. If they say no, then you can just make an entry in the logbook with their name, phone number, when you contacted them, and what you discussed.

Sincerely,
Ben Owen

AIRCRAFT MODEL:	RETAIL PRICE:	NET PRICE:
Acro Sport II O-360 180	$1095.00 *	
ENGINE/HP:	**HUB NOTE:**	
Lycoming O-360 / 180	38	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W76HZ5M8-58	W76HZ5M8-56	W76HZ5M8-60
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport II O-320 160	$1045.00 *	
ENGINE/HP:	**HUB NOTE:**	
Lycoming O-320 / 160	42	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W74EM-58	W74EM-56	W74EM-60
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport II O-320 150	$1045.00 *	
ENGINE/HP:	**HUB NOTE:**	
Lycoming O-320 / 150	42	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W74EM-56	W74EM-54	W74EM-58
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport II O-290 135	$1045.00 *	
ENGINE/HP:	**HUB NOTE:**	
Lycoming O-290 D / 135	42	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W74EM-54	W74EM-52	W74EM-56
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport II O-290 125	$1045.00 *	
ENGINE/HP:	**HUB NOTE:**	
Lycoming O-290 D / 125	42	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W74EM-52	W74EM-50	W74EM-54
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport I O-360 180	$1095.00 *	
ENGINE/HP:	**HUB NOTE:**	
Lycoming O-360 / 180	38	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W76HZ5M8-60	W76HZ5M8-58	W76HZ5M8-62

February 16, 1995

Dear Bill:

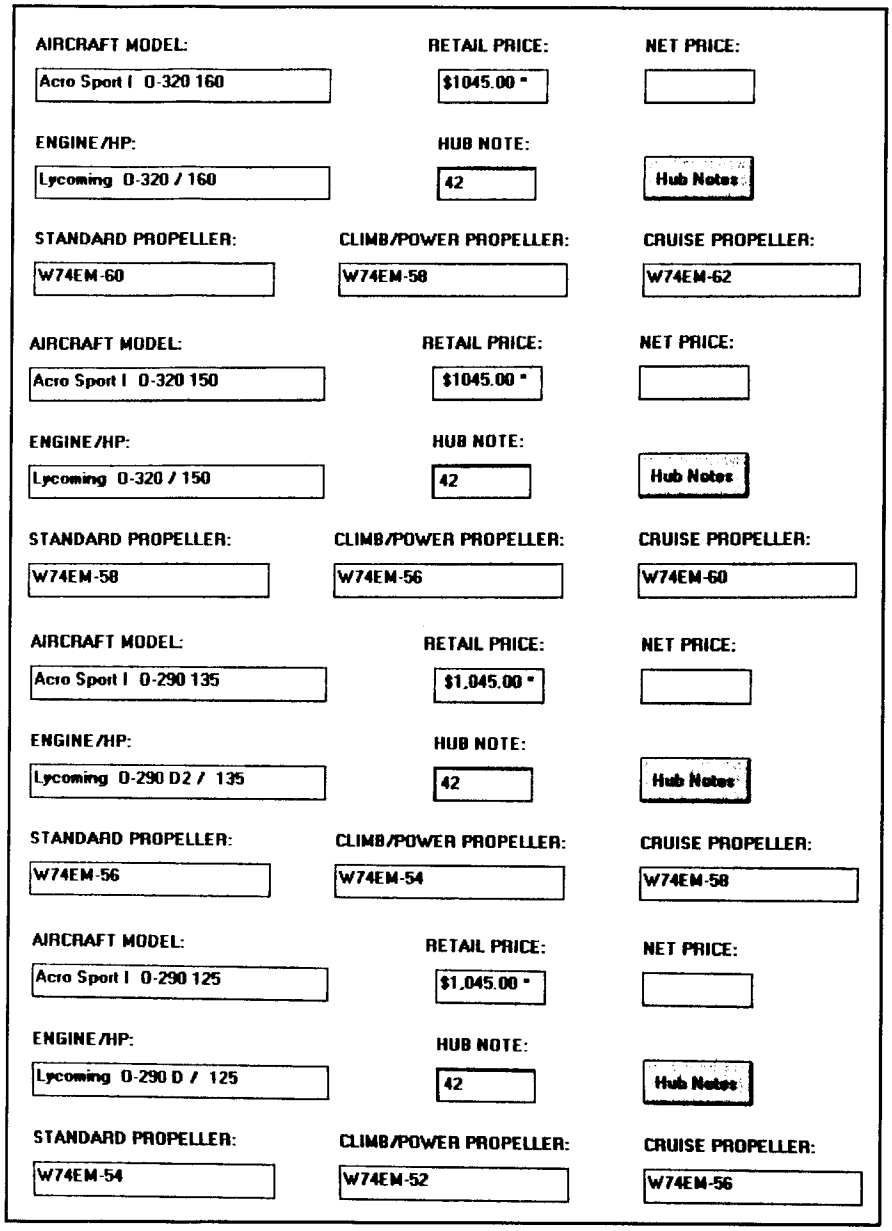
I am writing to give you an update and condition report on N611EV. As

you will recall, my building partner and I attended Sun & Fun last year. We had a very good trip and a great time. During our return trip, we were weathered in for almost 24 hours at Cross City, Florida. The operator/ owner of the facility and his family were very helpful and courteous to the forty or more people stranded there. I have never seen it rain so hard in such a short time! Remarkably, the Acro II survived very well.

Our next expedition was to Oshkosh '94. Randy was unable to get away from work, so I went solo. My wife and daughter went by car. Can you believe it? The family who would do that for a guy is just priceless! Arriving at OSH in my own handbuilt/homebuilt aircraft was a dream come true for me. We had a wonderful time that week, renewing many friendships, meeting a lot of very nice people, and generally having a great time. I had the honor of being awarded Second Place in the Acro Sport II Category and was also privileged to be asked to fly in the Homebuilt Review. That was very thrilling!

We now have flown N611EV for slightly over 100 hours. I have given many friends and acquaintances a chance to experience the fun of flying in an open cockpit biplane; for many, it was their first ride in a "small" airplane whatsoever. Everyone has been thrilled so far. I have also participated in the Young Eagles Program, giving several children their first exposure to Sport Aviation. They always exit the cockpit with a BIG smile on their faces! It is just as much a thrill for me as it is for them.

One problem that manifested itself after about 50 hours was the constant shimmying of the tailwheel. Since we seemed to be constantly having trouble with our landings, we searched to pinpoint the blame - the 8 inch Maule tailwheel, our inexperience with the Acro II, or the fact that we were landing on pavement. Finally, during a postflight inspection one day, it was discovered that one of the horns to which the tailwheel springs attach to the rudder was bent. Upon closer inspection, the bracket that is welded to the base of the tailpost for mounting the tailwheel was found to have a broken "ear". The result was that the spring assembly was almost free to rock or pivot on the remaining attach bolt. As you can imagine, that would have been disastrous if not remedied. This problem was resolved by fabricating and welding up an attach fitting made from various pieces of .063 4130 flat stock. This was then mounted on the outside of the tailpost with two bolts. Since the tailpost itself is hollow, and we did not think it would withstand the compression forces of the two attach bolts plus the other stresses naturally found there, we



inserted a solid aluminum rod into the tailpost to keep it from distorting upon assembly. The tailpost and the rod were simultaneously drilled for the two attach bolts. Voila! Problem fixed and no fabric work to do. I think the problem was actually self-imposed; that is, the plans call for fairly thin stock for the tailwheel mounting brackets in the tailpost area. In addition, we had trouble with insufficient clearance in the area of the support to be welded to the bottom bracket. We found we needed to file away some metal to clear the tailwheel spring horns. Apparently, we filed away too much. So you see, we were nearly "hoisted by our own petard." I purchased a Haigh type tailwheel assembly from Hal Wallace at Steen Aero Lab, as a substitute. What a difference that made! I would recommend this type of tailwheel to everyone. With the new assembly, you can still S-turn to see ahead with the tailwheel locked or you can unlock it to pivot sharply. Our landings have been much better and the roll-outs much straighter. Landings are now somewhat more relaxed since the new tailwheel assembly was installed. Make no mistake, the landings will always be a challenge for me. Can you say, "severe pucker factor"?

I am in the middle of a Condition Inspection so as to be ready for the start of the flying season this year. However, I have a couple of things to resolve before I get too far. I have decided to construct and weld a new engine mount, extending the distance from the firewall to the engine by 2.5 inches from the callout on the plans. I feel, and have felt from day one, that we got the tail too heavy during construction, (or the nose too light!). Even with the battery on the firewall and with a wood prop, I feel that the Empty Weight CG is too far back at 23.15% of MAC. Maybe it is

AIRCRAFT MODEL:	RETAIL PRICE:	NET PRICE:
Acro Sport Nesmith Cougar I C-85	$1045.00	
ENGINE/HP:	**HUB NOTE:**	
Continental C-85 / 85	01	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W72GK-46	W72GK-44	W72GK-48
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport Super Ace C-85	$1045.00	
ENGINE/HP:	**HUB NOTE:**	
Continental C-85 / 85	01	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W72GK-46	W72GK-44	W72GK-48
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport Pober Pixie C-85	$1045.00	
ENGINE/HP:	**HUB NOTE:**	
Continental C-85 / 85	01	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W72GK-46	W72GK-44	W72GK-48
AIRCRAFT MODEL:	**RETAIL PRICE:**	**NET PRICE:**
Acro Sport Pober Pixie A-65	$825.00	
ENGINE/HP:	**HUB NOTE:**	
Continental A-65 / 65	01	Hub Notes
STANDARD PROPELLER:	**CLIMB/POWER PROPELLER:**	**CRUISE PROPELLER:**
W72CK-42	W72CK-40	W72CK-44

just my unfamiliarity with sport biplanes, maybe not! Of course, this means new cowls all around, and probably some new hose assemblies, more painting, etc., etc. I am also contemplating a canopy of some type. I have not decided yet as to single hole or complete bubble. I like both styles, but I also would like to be able to convert to open cockpit when I want to. Without too much hassle, of course!

I will close now. As you can see, I have a lot of work ahead of me. I hope this is of help to you or anyone else out there. With all this work, I unfortunately will not be attending Sun & Fun this year.

My regards,
Emilio Verastegui
12304 Early Road
Knoxville, TN 37922
(615) 966-7133

Acrotale

After eleven years in the building process my Acro Sport II was test flown on 13 October 94. I selected an experienced CPI instructor friend who had considerable tail dragger time for the flight testing. The aircraft flew perfectly with no adverse tendencies and would you believe he made a perfect three point landing! His name is John Miller, owner/operator of Miller Field, a grass strip located approximately 12 miles s/sw of Bangor, ME. EAA Chapter 827 is also located at the field. There are few airports left of this sort where youngsters are able to see and feel airplanes and even get answers to their questions. I recall my early days of being enthralled at the very sight of airplanes. John is an avid supporter of general aviation and for many years has flown his aircraft to the EAA convention at Oshkosh, WI.

My project began using kits and components from various suppliers. Stits covering process was used throughout with good results. However, I would caution users to follow closely the procedures and precautionary measures listed in the Stits Manual.

Several minor modifications were made such as rounded wing tips in place of fiberglass, a six gallon fuel tank installed just aft of the main fuel tank, seats and seat backs covered with aluminum sheet in place of 4130 steel straps. Ocala Orange was selected as the main color with white sunburst stripes to be applied at a later date.

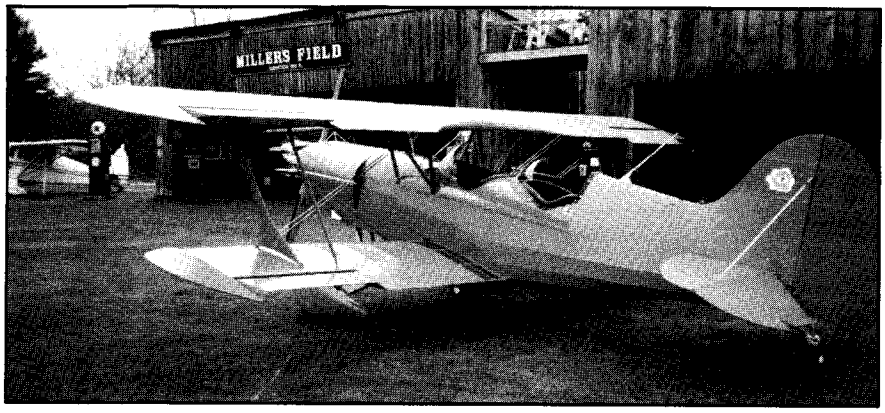
The engine I chose was a Lycoming O-320-E2D from a Cessna Skyhawk. The propeller is a Sensenich (wood)

Test pilot John Miller's "thumbs up" for N2082Y and builder Frank Schroeder.

W74EM56. The empty weight is 1068 lbs. with a C.G. of 65.073 inches. Cruise speed is 110 MPH at 2400 RPM.

I've had numerous compliments as to design and eye appeal of the airplane. Enclosed are photos taken prior to the test flight. My Acro Sport is a beauty to behold, Paul!

Best Regards, Yours truly,
Col. Frank R. Schroeder
17 Dunn Street
Thomaston, ME 04861



Frank Schroeder's beautiful Acro Sport II!

1994 Trials and Tribulations, Acro Sport II

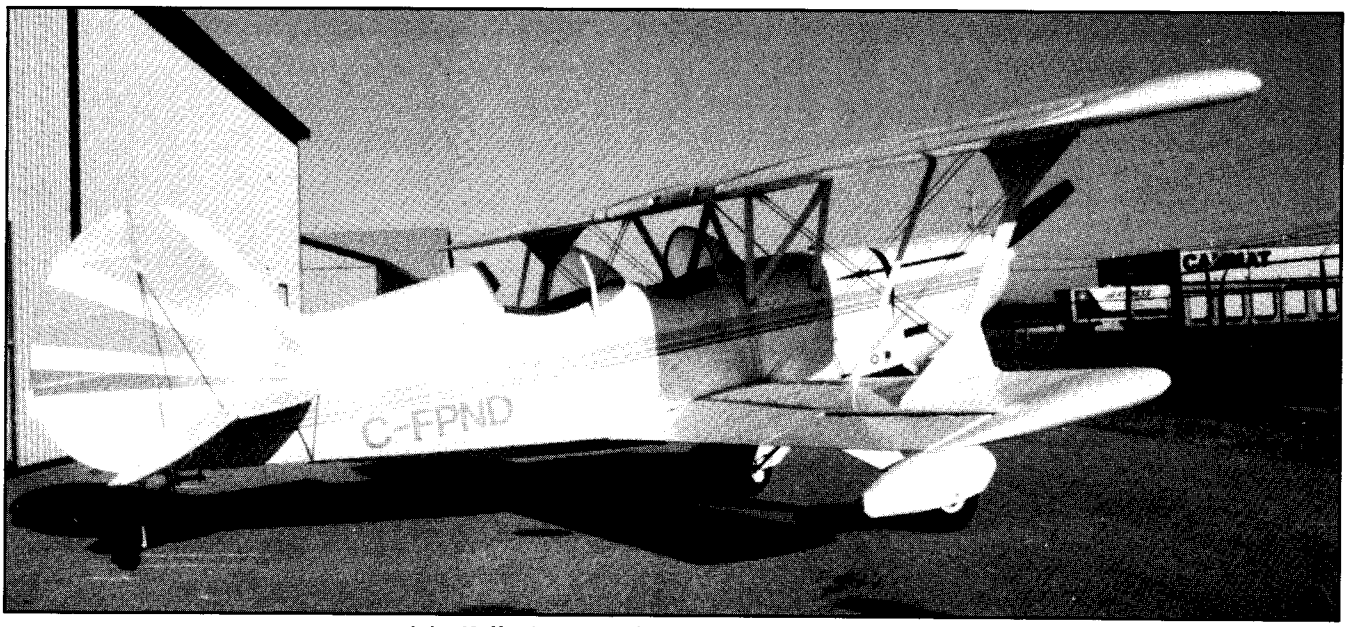
by John C. Kafford, 1607 Holden Drive, Sarnia, ON, Canada N7S 6G2

The first fight was conducted on February 19, 1994 at around noon. Paul Brooks, (fellow Acro II builder from London, Ontario), was satisfied that the aircraft was ready and the weather was cooperative. He took off from runway 33 and was off the ground in about 400 feet, and climbing better than a Cessna 172, (approximately 800 fpm). We had some minor problems such as lower RPM than expected, (2100 instead of the expected 2400 RPM), high EGT, (burnt the paint off the exhaust pipes!), and a tailwheel shimmy on landing. Some problems were easy to fix, but the low RPM was a "bear". The tailwheel shimmy was solved by replacing the Maule with a Scott 3200. Oversize 2" exhaust pipes were the source of the high EGT. But the RPM! I eventually pulled the engine off the nose in Mid-July and spent five weeks rebuilding the engine again. The camshaft was sent to Oregon, followers and lifters to San Antonio . . . It ended up being a faulty tach!!! The tach was tested early on, but I didn't inspect the credentials of the fellow who did the test. He calibrated the tach and claimed it was out by 50 RPM at 2000, but in reality it was out by 350 RPM! Paul, being used to his Acro II with 200 HP and a constant speed prop was "unsure" of my engine, so we assumed the low RPM was real . . . Ready to resume testing by the end of August. The airplane flew "hands off" with no rigging adjustment required and the trim in the neutral position.

TRANSITIONING TO THE ACRO SPORT II

About three months before I got to fly my aircraft, I took five hours of dual on a Citabria. I also had eight hours on a Jodel D11, but the Jodel didn't help since it had oleo struts and was easily wheel landed with no nasty habits. The Acro Sport was a very different story!! I have been flying single engine Cessnas since 1971 and found the difference in landing immense! Takeoff, climb and cruise were relatively easy. Landings took several hours to get comfortable with. After one hour of dual, Paul felt my time to solo had come. Looking back, I should have insisted on more time in the pattern and in particular, some time in crosswinds. It would also help to have flown some dual from the rear seat. We are all blessed with 20-20 vision in hindsight.

The first five hours I flew were a nightmare! I was totally unpredictable



John Kafford's reward for patience and persistence!

. . . an excellent landing one time . . . a disaster the next! The next five hours were done in a lesser state of stress. I finished off the mandatory 25 hours in a three week period and had the restrictions removed from my flight permit. The flight to bring Acro to Sarnia on September 30th was with mixed emotions. I was more than a little "up tight", but I remember the view as I cruised, and the aircraft felt great and exciting. I have a healthy respect for the aircraft. Unlike the very stable and docile Cessna-type aircraft, sport aerobatic aircraft tend to be closer to neutral stability and you have to fly the aircraft at all times, (no looking for maps, etc.). The light wing loading means you feel the turbulence more than the higher wing loading aircraft. I have several excellent flights, usually in early morning or at sunset when the air is smooth and the turbulence very light. I plan on leaving the aircraft in the hanger for most of the winter and getting into the flying again in April 95. I know that I will become more confident as my Acro II and I get to know each other better. Open cockpit flying is quite a thrill. It is also interesting to pull up to the pumps and watch people make a fuss over your airplane, (never happened in a Cessna!).

The Acro Sport Newsletter article by Neil Sidders, (Acro Sport Newsletter #41) was read, reread and memorized. Neil's letter made a whole lot of sense to me after my experiences those first few hours and contributed to better landings and increasing my confidence. Thank you Neil for your letter to other Acro II builders. I am glad that you choose to share you experience with some of us who can appreciate it!

I am running with a 150 H.P. Lycoming O-320 E2D engine driving a fixed pitch wood Sensenich propeller, (W74EM7-55). This combination results in a cruise speed of approximately 95 knots at 2400 RPM. Build time has been 2700 hours. I started building March 1990.

Ed. -- John is hereby awarded the 1995 Candor Award for honesty and accuracy in reporting landings! Builders who are nearing completion of their tail draggers might wish to look for a nice forgiving grass strip for the first 100 landings. It could save a lot of terror and frustration!

Oshkosh Forums

The Acro Sport I and II forum will be in Tent 6 on Monday, July 31st from 11:30 to 12:45. Don Baker will again be the moderator with Rich Hartzell, Paul Felkner, Mike Finney, Lee Farnsworth and Paul Muhle on the panel.

The Pixie, Junior Ace and Pober Super Ace forum will be inTent 6 on Tuesday, August 1st from 11:30 to 12:45. M. John Leitis, Moderator, and Hart Jewell.

1995 Acro Sport Awards Dinner

The awards dinner will be at Robbins Restaurant Monday evening July 31st with cocktails at 7:00 and Dinner at 8:00 P.M. Please see LaFonda Jean Kinnaman at the Acro Sport/Polyfiber tent for reservations.

Sun & Fun Forum

Our thanks to Rich Hartzell and Bob Callis for making the Sun & Fun Acro Sport Forum a success. We were also honored by words of wisdom from Paul Poberezny and Ray Stits.

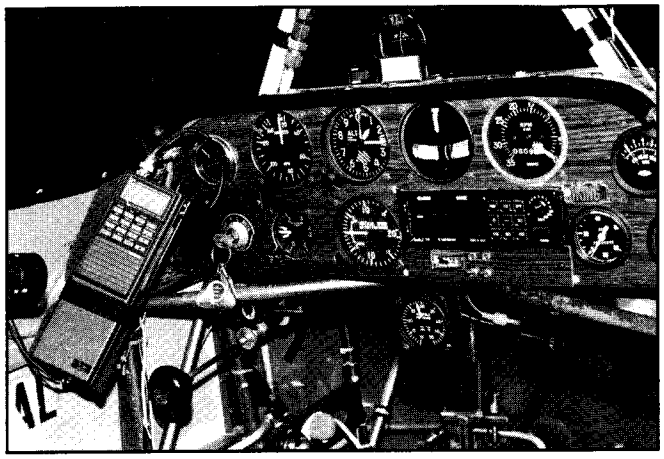
800 Hours of Fun in a Pober Pixie

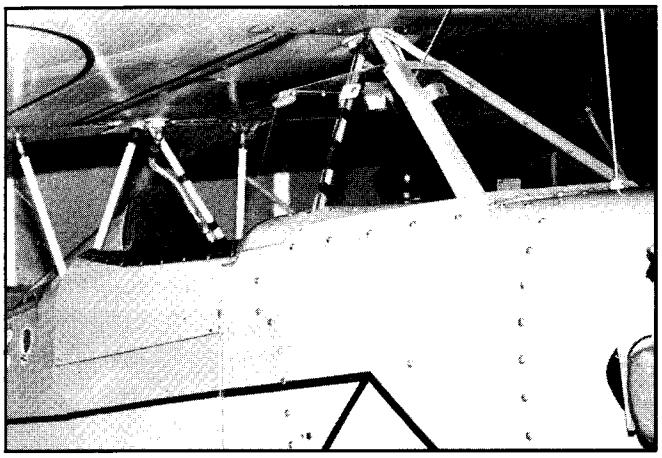
M. John Leitus
817 Roosevelt Avenue
Roaring Spring, PA 16673

N81JL at Home Base, Newry, PA..

Fourteen years ago on November 4, 1981 I test flew my Pober Pixie N81JL for the first time. Today while flying the tach time revolved past 800 hours! The Pixie is performing every bit as good today as it did on the first flight which lasted 45 minutes. On that flight I forgot it was a home-built; it flew just as good as any certified aircraft. I had a lot of experience in a Citabria 7ECA, and my Pixie made me feel just as safe and secure as the Citabria did. Extra thanks to Paul Poberezny for creating a great little airplane for all aviators who choose to build and fly the Pixie! My first flight to Oshkosh occurred in 1982 and I've made it every year thereafter, a total of nine trips of trouble-free flying.

In 1982 a Bendix magneto SF4N8 was replaced by a Bendix S4RN21 with impulse for safer engine starts. In 1984 two changes were made; I replaced the single-ply tail spring with a two-ply spring, (during a routine inspection I found a crack in the single-ply spring), and for safer cross-country flying, I installed a larger fuel tank, (16 gallon). This tank is protruding two inches above the wing, contouring the airfoil. It was inspected and approved by FAA GADO of Pittsburg who required the return of the aircraft to the test area for five hours, which I completed in a few days. The test flights indicated no changes in flight characteristics nor in performance. The larger tank enabled Oshkosh trips with longer flight legs, only four fuel stops. The 75 HP Continental drinks 4.7 gal/hr which gives very safe 2 1/2 hours of flight. Also in 1984 an Apollo 602 Loran receiver was installed. With a nav/com aboard, the





LEFT - Leitus instrument panel with ICOM 21A nav/com and Loran C Nav. RIGHT - Three panel windshield keeps cockpit comfortable on those long cross country flights.

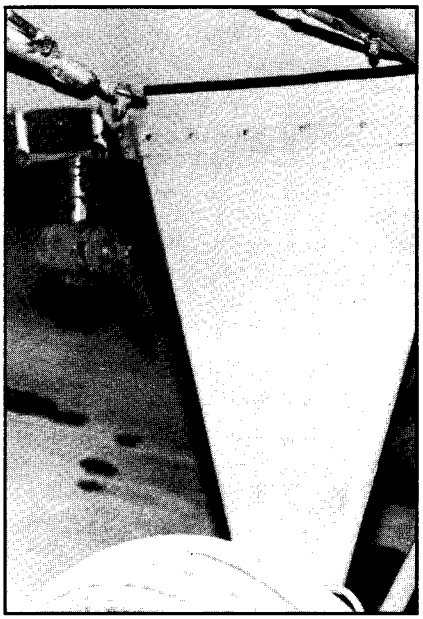
cross-country flying became quite a pleasure, however the map, watch and compass are still the Pixie's most important navigational tools.

I did have some problems with the engine at the beginning. I had bought the engine from a fellow flyer who had it in his Piper PA11. The engine log book showed a major overhaul had been done prior to the removal from the PA11. It performed satisfactorily with the exception of running hotter than it should. The log book showed the engine had its cylinders bored oversize, new valves, rings and bearings. We installed new pistons and rings, (15 thou. oversize), connecting rods, hydraulic lifter units, and had the crank undercut 10 thousandths. We installed it with 10 thou oversize bearings. We also installed a rebuilt Bendix SF4RN8 magneto, (lunch bucket size), on the right side, new shielded ignition wires and new plugs. After the 1981 Oshkosh convention the engine was assembled and installed in my Pixie. It ran great and still does with oil temperature staying slightly under 180 deg. and oil pressure at 38 lbs.

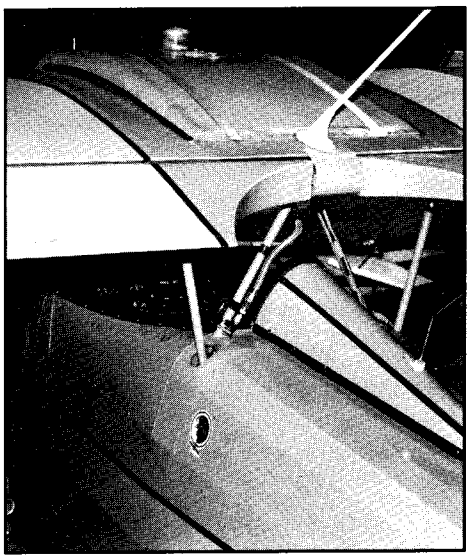
What a joy to fly my Pober Pixie! Every year I look forward to participating as a moderator for the Pixie forums; helping Acro Sport and interested flyers gives me great satisfaction. Seems like the one hour meetings are not long enough to disseminate all of the information and experiences that Dr. Jewell, Bob Green, I and others have to present. Working in the workshop also gives me a great pleasure and a chance to meet a lot of builders and would-be builders, as well as helping with hands-on experience.

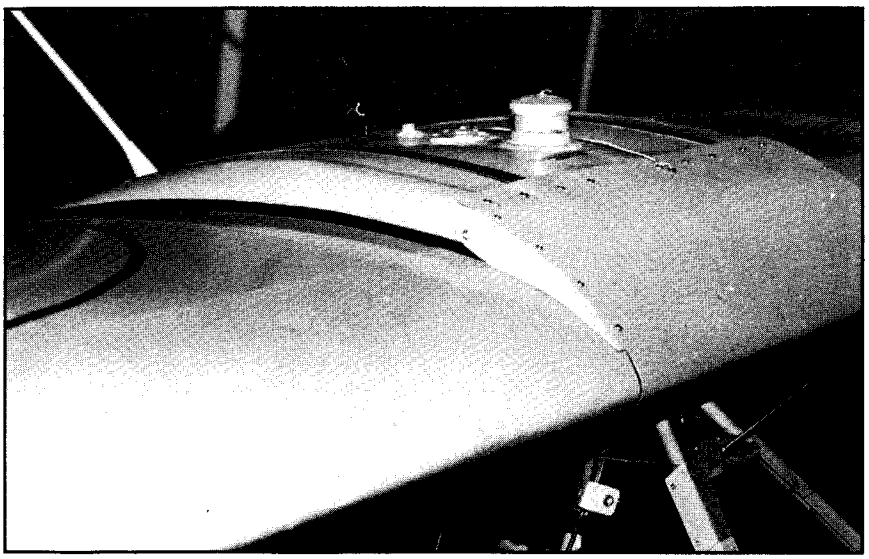
As far as I know, the Pober Pixie has proven to be a very safe and accident-free aircraft design, except for one Pixie crash, (totally destroyed), near Mexico Farms Airport in Cumberland, MD which occurred a couple of years ago due to the engine failure; No fatality.

Looking forward to seeing you and others at Sun and Fun and at Oshkosh.



Pixie's generator, a DC electric motor with model airplane 8"D x 8½" prop producing 5 amps, 14 volts.





LEFT - John Leitus' larger fuel tank also serves as Loran ground plane. RIGHT - Frontal view of 16 gallon fuel tank.

Pober Junior Ace / Bulletin No. 1

February 3, 1995

As with any aircraft design, whether military or civilian, there have always been updates or changes in design features. Taking measurements from a prototype airplane or from preliminary drawings or sketches and transferring them to a final set of drawings is a task for the draftsman.

The prototype Junior Ace has flown some 80 hours, much of the time used in the EAA Young Eagles Program at Pioneer Airport. Due to its success, we are building up two more examples of the Pober Junior Ace for use at Pioneer Airport. These aircraft are being constructed in the Aeroplane Factory, a place where volunteers can learn to build! In the process, we have come upon some updates and changes. One of the aircraft we are putting together will be powered with a new Lycoming O-235 of 118 H.P. As of February 1995 the fuselage has been welded and all wing ribs and spars completed. This airplane will incorporate the Fries ailerons which should reduce aileron pressure from the original ailerons.

Following is a list of changes and/or recommendations as of February 3, 1995:

I. An updated "Fries" aileron rib drawing giving adequate clearance in the up and down travel of the aileron in the rear spar aileron channel is included with plans.

II. The finger plate - additional reinforcement over the top of the wing cabane attach fittings, front and rear did not match the tubing; a sample shows it as prepared from the Junior Ace being constructed here.

III. Wing Rib No. 17 at wing tip. Plate one side toward wing tip bow with 1/16" plywood. The builder may consider installing a full wing rib, and shortening the outboard end of the Fries aileron, thus bringing the wing tip bow to the trailing edge of the full wing rib. The wing rib aft of the rear spar should be plated on both sides with 1/8" plywood. A 1/4" triangular block 3" in length should be installed in the trailing edge rib for secure attachment of the wing tip bow.

IV. The Wag Aero fuel site gauge should be installed at rear of fuel tank.

V. Before welding in the crossover tube between front and rear wing cabane, it is recommended that the wings be fitted to the cabanes and the crossover tube tack welded in place using the wings as a jig.

SHEET 1.00 zone C5 Top view station 2 & 3, change 36" to 36-3/8"

SHEET 7.00 zone C40 Change 3-3/16" to 3/16" on plywood plate

SHEET 7.00 zone D37 5/32" tube callout should read: .035 x 5/32 tube.

Coil springs for the Pober Super Ace and Pober Junior Ace can be obtained from:

Wicks Aircraft Supply, P.O. Box 129, Highland, IL 62249, 618-654-7447 or Oshkosh Coil Spring Company, 3675 N. Main, Oshkosh, WI 54901, 414-235-7620.

Spring compression for the Pober Super Ace, based on a gross weight of 1180 lbs., would be 590 lbs. each spring, compressed one inch.

Spring compression for the Pober Junior Ace, based on a gross weight of 1300 lbs., would be 650 lbs. each spring, compressed one inch.

The springs we used have a 3/8" wire, 12-1/2" long, 1-3/4" outside diameter, and 3/4" pitch. The bottom should be ground flat, as the top, so that when they fit into the tubing they will be bearing down on a flat surface.

JUNIOR ACE BUILDERS! If you have not received a set of drawings for these revisions, please contact Acro Sport Inc., P.O. Box 462, Hales Corners, WI 53130.

Continental A 75-8F engine, 0 time since total restoration from data plate up. Also matching Sensenich 70-44 prop. MY Pixie cruises 87, tops 95 with an identical A75. Call for details. Hart Jewell, (415) 383-1928.

Notice!
Acro Sport II
Full Size Wing Rib Drawings

The printer down-sized the Acro II plans, making the "full size" wing rib drawings too small. If you have the small drawing, please contact Acro Sport and a full size rib drawing will be shipped to you free of charge. Send plans serial number, name, complete address with zip code to: ACRO SPORT, P.O. Box 462, Hales Corners, WI 53130.

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