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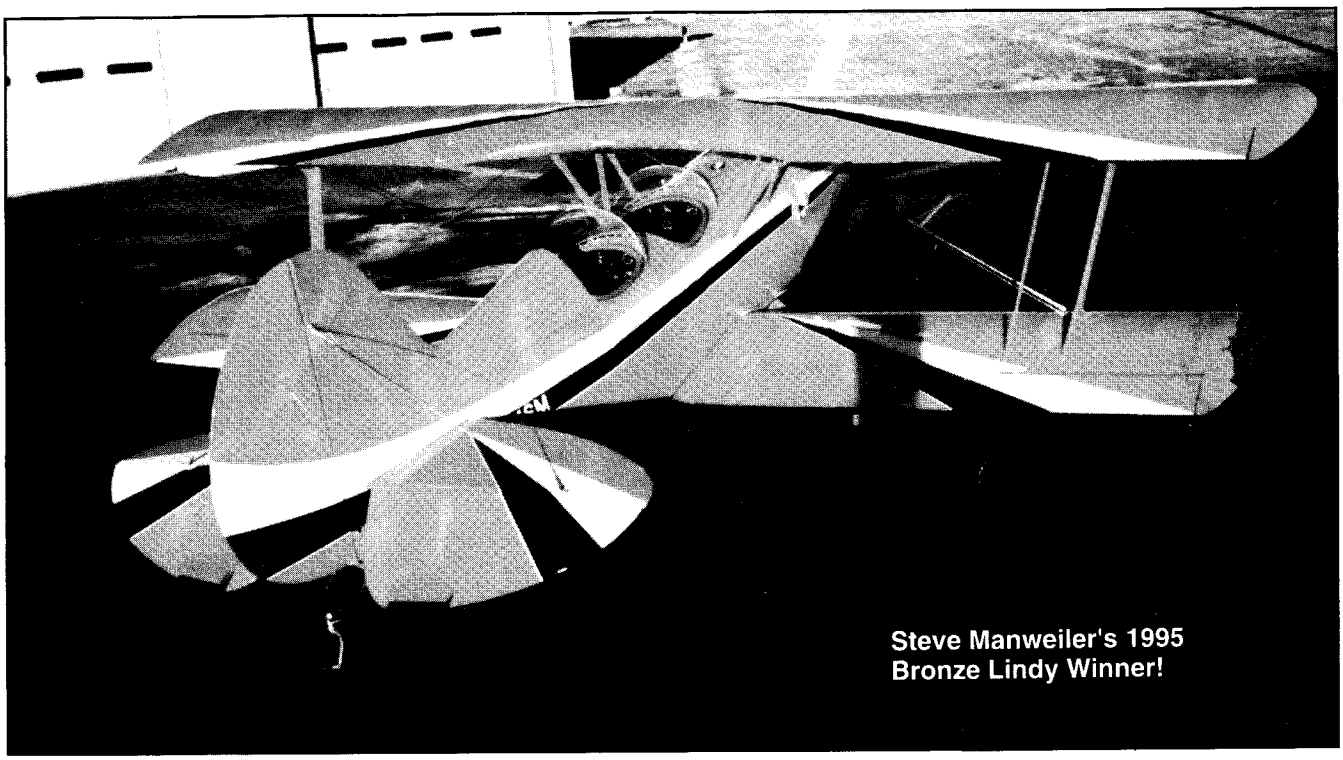


Steve Manweiler's 1995 Bronze Lindy Winner!

Steve Manweiler's Lindy Winner

Dear Bill:

Thanks for the encouragement to send my experiences with the Acro Sport II to you. I have enjoyed reading the letters and advice from fellow builders over the past 11 years, (yes eleven!), that I have spent building my Acro Sport II, N94SM. The last two years of the building project were more intense in an effort to complete the airplane for Oshkosh '94. My wife Linda remarked how lonely it was in the house with me out in the garage evenings. The airplane is affectionately named "Lonesome Linda". We didn't make it to Oshkosh '94, but I took the week off work anyway and completed the airplane.

I wanted to build the Acro Sport II the first time I saw the prototype, but almost talked myself out of the project because I thought it would take ten years to complete --(I almost got it right!). After considering simpler projects, I finally realized the Acro Sport II is what I really wanted so I would build the airplane I wanted to have rather than an airplane I wouldn't be happy with after the project was complete. I made the right decision. If I can pass on any information to someone deciding on a project, it would be to build the airplane of your dreams, then you will complete it. In October of 1983 I received the material to start the wings for my Acro II. During the building of the wings, I enrolled in a Vo-Tec Welding course to learn what I needed to know about the balance of the project. I would recommend Vo-Tec as a really economical way to learn to weld.

As I was a beginning welder, I approached the fuselage with much trepidation, but was delighted to find the cutting and fitting and tacking to move along rather quickly, and it was easy to see what was accomplished each day.

My airplane is built according to the plans with very little departure. I did use 7/16 aluminum tubing for stringers in lieu of wood. The cockpit covers were widened at the front to have a more complete view of the instrument panel.

My first flight was accomplished on September 24, 1994

Sun 'n Fun Forum — Sunday April 14 at 11 a.m.

after two sessions flying a local Acro Sport II with the owner acting as an instructor. My flying experience includes approximately 300 J-3 Cub hours and this was helpful, but the performance of the Acro Sport is much livelier than the Cub, and I was glad for the dual in the Acro Sport II prior to my first flight.

The first takeoff in an airplane that you have spent 11 years building is something that is hard to describe and impossible to forget. A moment of joy only over-shadowed by a successful landing!

My "instructor" taught me to do totally power off landings from downwind to base holding 80 mph and a slight slip to keep the runway in sight. This technique works great and 3-point landings are the rule for me. Cross winds to 30 mph, (yes this is Kansas!), have been accomplished, however they do test your resolve.

N94SM is powered by a Lycoming IO360A1A from a Mooney Ranger. Induction air is taken from the front left intake baffle. The nose bowl was expanded to accommodate the engine and was split horizontally to allow easy access to

EDITORIAL/**Something's Gotta Give!**

by Bill Berrick, Editor

I have mentioned before that I originally used two 1280 HD bungee cords on each side for my Acro Sport I landing gear, (Newsletter #46). Those would stretch and let the airplane start to sag after about one year of use, so I tried two 1380 bungees on each side. That made the gear feel like the shock struts were welded solid; then I tried one 1280 and one 1380 on each side. It helped a little, but still when I would grasp a wingtip to rock the airplane, the only visible action was in the tires with no movement in the shock struts.

I have now installed new shock struts using Smith Miniplane type compression springs, and at last we are back to about the same amount of cushion effect as the original 1280 bungees had given. I like the way they feel on landing, and hope they will be trouble-free without the challenge of an annual change of bungees. But there is more to the story, bad news and good news.

We had enjoyed a formation flight back from a fly-in breakfast on a beautiful Sunday morning in August. I made a decent landing back at the home base, but did bounce it a little and heard or felt a distinct "clunk"! It was a wheel landing at enough speed to continue uneventfully down the runway on roll out, giving me time to think, (and worry!), about what made the noise. I found out when the speed slowed, the tail wheel came down, and the whole airplane squatted down as the shock struts came loose from their central attachment to the fuselage frame!

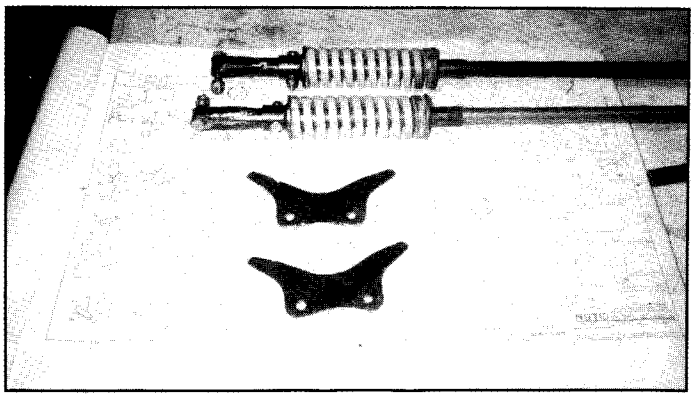
The two plates that are welded to the "V" under the fuselage and bolted to the ends of the shock struts had broken loose at the welds! The good news is that they still held the shock struts to each other so that the main gear legs spread out but didn't let the prop down into the concrete! As I slowed to a stop and turned off at the taxiway, one wing dropped and dragged the tip with enough damage to require some fiberglass repair work.

The first lesson, I think, is that two 1280 HD bungees on each side are about right for this airplane. The 1380's are much too un-forgiving. Don Baker used the compression spring type shocks, and anything good enough for him is surely good for me!

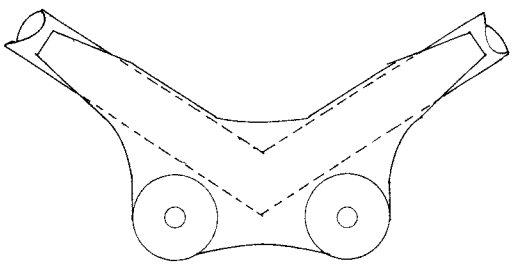
The second lesson for me is that four welds, each about 3/4" long that held the plates to the "V" tubing couldn't stand the kind of punishment the heavy bungees, (and some less than perfect landings!), were giving them. These plates are shown on the Acro Sport I plans Sheet 1.01, zone B9; and on the Acro II plans Sheet 3.0, zone A5.

I think it would be worthwhile to heat the tops of these pieces after tack welding in place, then hammer the top center parts inward in order to lay them down on the tubing and allow more welded area. Steve Manweiler made beautiful inside fillet welds on his, front and back, and they certainly are secure. I went one step further now by making new plates with "ears" or "fingers" on the top corners and rolling these down against the tubing after tacking in place and heating. This gave a length of about 3" of weld on each.

I'll also work on trying to caress the runway on landing rather than assaulting it.



Compression type shock struts and modified connector plates for editor's Acro Sport I.



Modified plates for shock strut connection used on editor's Acro I. (Not a change to original plans).

ACRO SPORT I, see Sheet 1.01, zone B9
ACRO SPORT II, see Sheet 3.0, zone A5

the engine without prop removal. I can provide information to anyone wanting to know how to do this; it is extremely simple. A wood fixed-pitch Sensenich prop and certified thrust plate have been used, I have had no problems restarting the engine with the wood prop. I was told there would not be enough "fly wheel" to facilitate hot starts with the fuel injected engine --no problem.

PERFORMANCE FIGURES:

Full power 2700 rpm climb @ 100 mph: solo 1500 fpm; dual 1100 fpm.

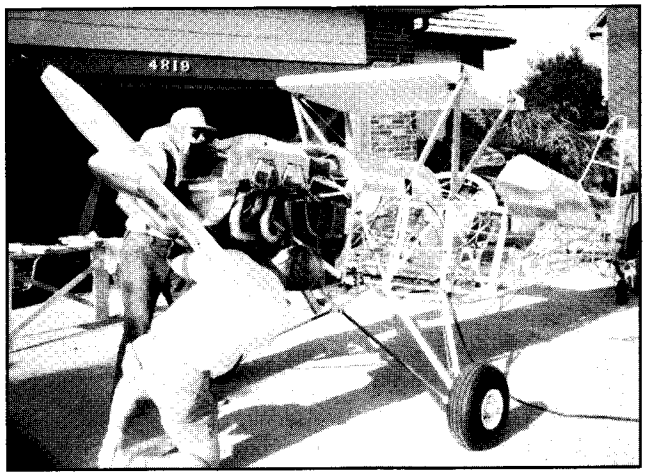
Cruise 3000 ft., 2500 rpm: 115 mph indicated.

Full power level, 2900 rpm: 133 mph.

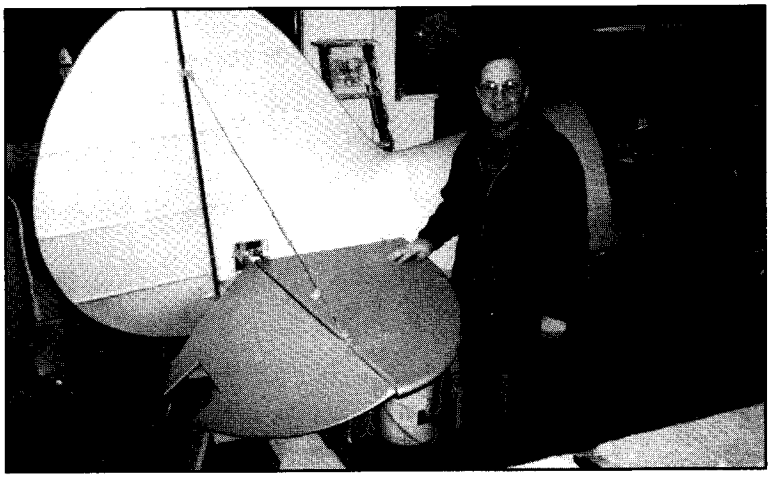
Pilot weight 220 lbs.

Empty weight of aircraft, (w/oil), 1081 lbs.

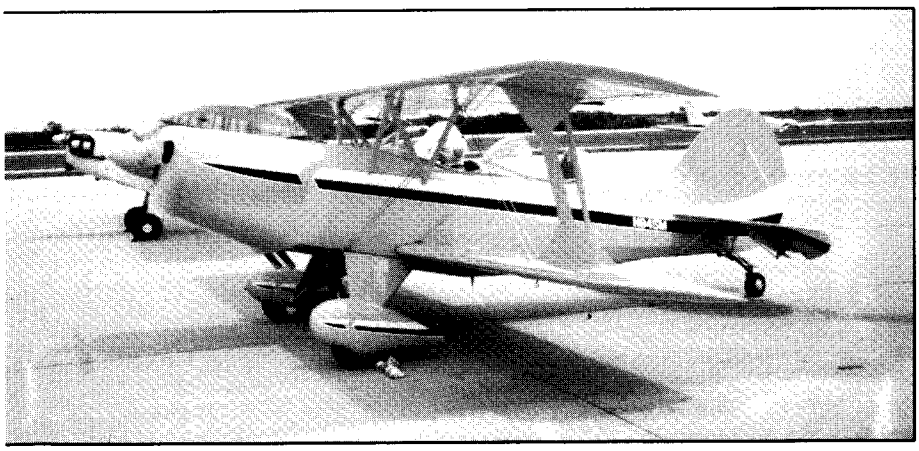
I am not an aerobatic pilot and I have approached aerobatics cautiously, usually flying with a friend in his Citabria and then moving solo to my Acro Sport II. Many thanks to

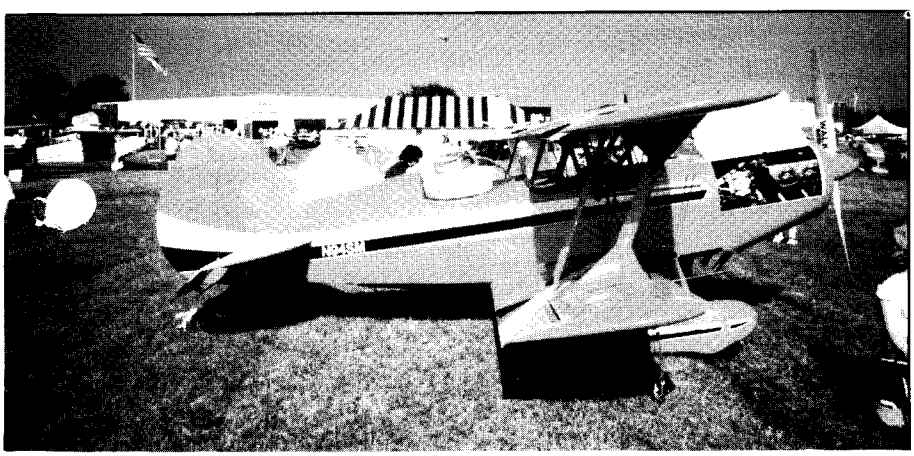


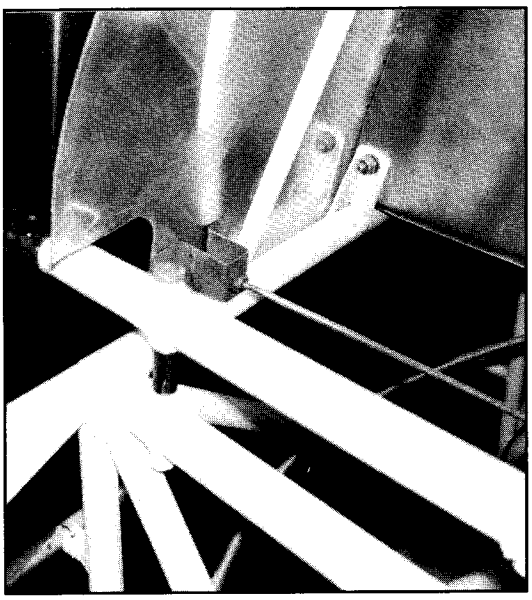
First time in daylight,; proir to first engine run.



Above. . . Steve Manweiler using formers to bring leading edge metal in full contact with ribs before screwing to spar.
Above right. . . Builder Steve Manweiler nearing completion on his Acro II.







Above. . . Steve used this small rod inside the rear of the turtle deck to prevent metal edge from showing through the fabric.

Above left. . . The Manweiler N94SM with Steve's 1938 J-3 Cub.

Left. . . On the flight line at Oshkosh 1995 where this excellent aircraft was a winner of a Bronze Lindy.

Don Baker for his excellent articles on Acro Sport aerobatics!

Spins have been performed left and right for 2 turns each way, loops using entry speeds from 140 mph to 120 mph, aileron rolls at 135 mph, and split "S"s -- stay high on these.

The Acro Sport II is a delightful airplane to fly, very predictable, very forgiving. I have done everything wrong doing loops that you can do, and the airplane flies just fine when pressures are released. Then I go home and get Duane Cole's "Conquest of Lines and Symmetry" to see what I did wrong. Great Book - Great Author - Great Pilot!

I am always available to answer any questions builders may have, and also to give some dual to those who may be getting ready to fly their machines, or to just give a ride to anyone interested in the Acro Sport II

I was very honored to be presented the "Outstanding Acro Sport II" award at Oshkosh 95. Thanks to the Acro Sport, Inc. organization for their support. This is an exceptional airplane and I am very impressed with the quality of Acro Sport II aircraft I see at Oshkosh and other airshows.

Very truly yours,
Steven R. Manweiler
4819 Farmsted Cr.
Wichita, KS 67220

Editor: Steve's N94SM also won GRAND CHAMPION Awards at Kerrville and Bartlesville shows!

Steve's wife Linda with "Lonesome Linda".

Ten Years of Acro Sport Award Winners at Oshkosh!!

Can any other design equal this?

1986 Outstanding Workmanship, Doug Bell, Acro Sport I, N176DB, Cadillac, MI
1986 Silver Lady Reserve Grand Champion, Al Smith, Acro Sport II, N4233T, Macon, GA
1989 Outstanding Workmanship, Don Baker, Acro Sport II, N122DB, Rockford IL
1992 Outstanding Workmanship, Wallace Weber, Acro Sport II. N819WW, Hastings, MN
1992 Bronze Lindy Champion, Paul Felkner, Acro Sport II. N651PF, Centerville, IA
1993 Bronze Lindy Champion, Wallace Weber, Acro Sport II, N819WW, Hastings, MN
1993 Bronze Lindy Champion, Paul Muhle, Acro Sport II, N42690, Richland, NE
1994 Gold Lindy Grand Champion, Paul Muhle, Acro Sport II, N42690, Richland, NE
1994 Bronze Lindy Champion, Mike Finney, Acro Sport II, N165N, Albany, IN
1995 Bronze Lindy Champion, Steve Manweiler, Acro Sport II, N94SM, Wichita, KS
1995 Bronze Lindy Champion, Don Baker, Acro Sport II. N122DB, Rockford, IL

Letters To The Editor

Israel, 6 Sept. 1995

Dear Bill,

My Acro II project is approaching the final stages, and the struggle with the local CAA has begun. They require that I present, before they issue me a permit to fly, a Pilot's Handbook/Operations Manual with information regarding: Normal Flight Procedures, Emergency Flight Procedures, Scheduled Maintenance, Performance, Limitations etc.

In all fairness I must say that their request seems reasonable. Unfortunately, the information supplied with the plans is insufficient and lacking. After reading your editorials in the Newsletter, I came to the conclusion that perhaps you have established such a manual for your aircraft. If you have - I would be most grateful if you could send me a copy of your book. I will of course pay for all the involved costs. If you do not have such a book, perhaps you could guide me to someone that does.

I would also like to hear your opinion regarding the strength/structural integrity of the Acro II. Do you know of anyone who has done a strength analysis of the structure? Is there a data basis for the strength analysis with the Acro Sport, Inc., (Safety factors, life cycle, fatigue, etc.)? If you know, please inform me.

I thank you very much for your cooperation and I hope to hear from you soon.

Rudi Bertocchi
Tel: 972-9 574 758
Fax: 972-9 583 543
48 Medinat Hayehudim St.
46766 Herzliya
ISRAEL

Editor: I wasn't able to help, but if any of you have any part of the needed information, please send it to me to share with Rudi and our other readers. (Also see Ben's letter to Rudi).

November 3, 1995

Dear Rudi:

Thank you very much for the letter. I have attached a listing of those Acro Sport II builders that might be helpful to you. We never did directly develop a Pilot's Handbook for Operations regarding normal flight procedures, scheduled maintenance, etc. We do have an aerobatic aircraft that can take at least +6 and a -3 Gs, that has been flown in most of the aerobatic maneuvers. Airworthiness of the aircraft is considered the responsibility of every individual builder.

Here in the United States, we have a great deal of freedom to build and fly. Basically, our only requirement is that the aircraft be built - major portion - by the builder. The FAA inspector looks it over finally to give his opinion as to airworthiness, but no further design or en-

gineering is necessary. The aircraft is test flown in a local area, within about 25 statute miles of the airport; this takes about 25-40 hours. Once this is completed, the aircraft is free to go outside of this area, to be used for sport flying and pleasure carrying. Any aerobatics that are accomplished in the testing period are entered in the log book, and can be done outside the testing period. Once these basic maneuvers, like stall maneuvers or combinations of loop, roll, spin, and possibly stall turns are entered, practically all aerobatic maneuvers can be done after that.

It is possible that some of the builders may be able to advise you as to their operations., Otherwise, the operation of the aircraft is straight forward, much as would be done with any trainer. As to structural strength, the aircraft has been test flown in most of the aerobatic maneuvers known in the FAI Aerobatic Code. They have been flown in competition by individuals in aerobatic flight with no problems. We have not seen any items that are important regarding life cycle or fatigue at this time.

For insights from an Acro Sport II builder/pilot who has done extensive acrobatics in the airplane, you can contact Don Baker, 10222 Springborough Dr., Rockford, IL 61107-2957: telephone: 815/885-1088 (home), and 815/394-3264 (work).

Sincerely,
Ben Owen,
Executive Director,
EAA Information Services

Dear Mr. Berrick,

My name is Scott Spencer, and I am building an Acro Sport II. I attended the EAA S. E. Regional Fly-In at Evergreen, Alabama this past weekend. Attendance was down due to bad weather on Saturday, but there were still some nice aircraft there. Unfortunately, there were no Acro Sports, but there was one real nice Skybolt.

I am writing to ask you if anyone has ever fitted or used a Marquart, (Marquat... I don't know how it's spelled-sorry), landing gear on an Acro Sport or Acro Sport II? The Skybolt had it, and it was a really beautiful and clean job. It looked to be very stable and very aerodynamic! I've seen photos of Acro's with spring steel landing gear in place of the bungee cords, but not with the Marquart gear. Is that type of gear even feasible or possible, with the necessary modifications of course, on the Acro Sport II?

I would prefer not to use the bungee cord gear for the simple fact of aerodynamics and having to put the darn things on. Would the spring steel gear be better suited for the Acro Sport II than the Marquart gear? Any advice or direction you can and will offer would be greatly appreciated.

I purchased my plans back in January and have been building my lower wing ribs. Needless to say, I have a ways to go before I have to worry about the gear, but I am trying to plan ahead for the changes I am going to make, I am also trying to determine what type of costs I will incur with a change in the landing gear.

Thank you for taking the time to read my letter and I look forward to hearing from you. I have enclosed a self-addressed and stamped envelope for your reply. I really enjoy the Acro Sport Newsletters and can't wait to receive the September issue.

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

November 21, 1995

Dear Scott,

I apologize for being so slow to answer your letter of last month. Ben Owen told me he had talked to you by phone about the possibility of using the Marquardt type landing gear and discouraged its use because the Acro Sport II fuselage is not designed to handle that kind of load.

Acro Sport Newsletters #13, #15, and #17 each had articles about using spring steel or aluminum landing gears, and some illustrations of how builders beefed up the longerons to carry the load. Some of those builders would have enough experience by now to know whether the spring gear worked out well. Issue #15 included an excerpt from a Frank Christensen letter in the August '86 issue of Sport Aerobatics which warned about longeron fatigue cracks occurring in Eagle II aircraft from torsional loads of spring aluminum landing gear struts. He recommended installation of a modified strut clamping system to prevent torsional loads.

I share your distaste for changing out the bungee cords and have changed to the compression spring type shock struts on my Acro I.

Please send me some letters and photos of your progress and solutions to problems as you are building your airplane. We have had good ones from Joe Spencer, (your family?), from time to time and would surely like to hear more from you.

Sincerely,
Bill Berrick, Editor
Acro Sport Newsletter
11803 Hunters Cove
Omaha, NE 68123-1119
(402) 292-6832

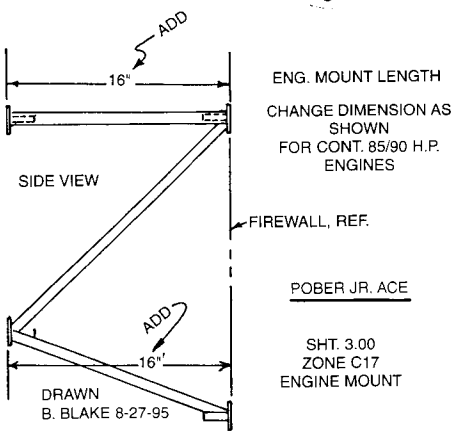
Updates on the Aces From Paul

Dear Bill:

I am enclosing a change for the Pober Super Ace drawing, as well as one for the Pober Junior Ace.

Regarding the Pober Junior Ace, though the plywood dimensions are shown on another drawing, it has caused some confusion when the plywood thickness was not shown on an overall wing drawing.

On the Pober Super Ace, we have found that it would be best to lengthen the engine mount from 9" to 16" for the Continental 85 or 90 HP engines, especially when starters, batteries and generators are not installed. It would be best to just lengthen the engine mount to have a more nose heavy condition rather than adding some weight, as we did on the prototype Super Ace. With the great variety of engines and propellers being used, it is often difficult to match the powerplant, electrical system, battery location, etc. with engine mount length.



POBER JR. ACE

SHT. 7.00
ZONE C40

CALLOUT FOR PLYWOOD PLATE, BOTH SIDES OF SPAR BUTTS SHOULD READ, 1/8" PLYWOOD, BIRCH OR MAHOGANY." FOR WING FITTINGS

We have been working on two more Pober Junior Aces and have just finished installing an O-235 Lycoming on one of them. The airplane is now on the gear, but we still have a lot of work to do. I would like to get the airplane far enough along so that it can be covered during next year's Convention. Ray Stits said that if I get it as far as I can, he will

personally work on it along with a couple of helpers that he will bring from Riverside.

On this airplane we are only going to install one door on the right side. We will keep the longeron on the pilot's side intact rather than having two doors. This will add a little rigidity to the fuselage for the heavier engine.

On the prototype Junior Ace which had the old style ailerons like the Waco 10's and a lot of the old airplanes of the 30's, we taped the ailerons and found a much improved aileron effectiveness. On the Pober Junior Ace drawings we have both types of ailerons - the frieze and the old type.

I am taking my PT-23 out of the shop and will be able to move the Junior Aces that are under construction into an assembly line set-up. I will be taking more pictures of them which I will forward to you for use in the Acro Sport Newsletter.

Please feel free to mention that anyone having any questions relative to the construction, etc. can drop me a note and I will try to answer them personally, as well as in the Acro Sport Newsletter.

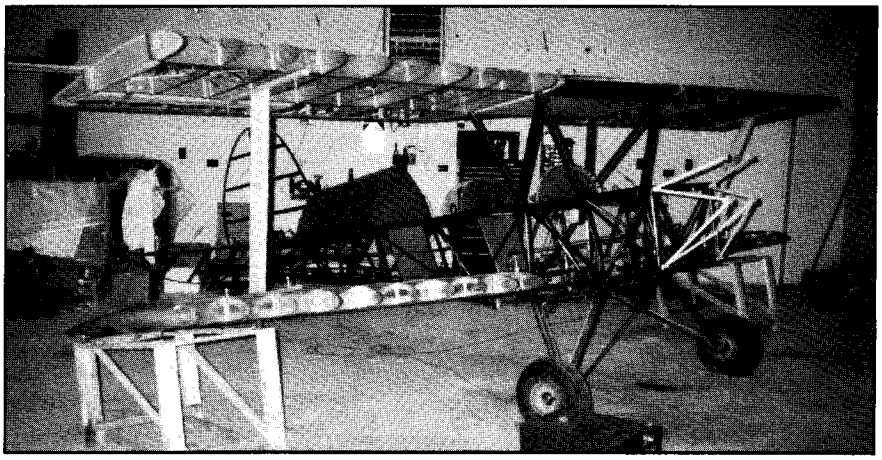
Audrey and I just returned from the Reno Air Races. The races went along pretty well. There were no accidents, and only a few maydays. The airplanes that attend always seem to be the same ones.

Our best to you.
Sincerely,
Paul H. Poberezny
EAA Aviation Center
P.O. Box 3086
Oshkosh, WI 54903-3086

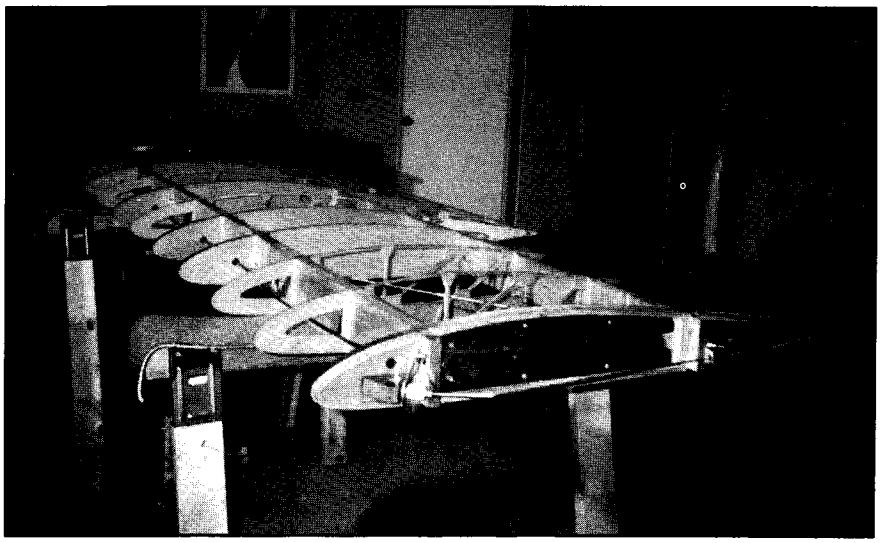
Progress Report by Dick Merkel / 28 Feb 95

I work at an ACE Hardware store in the Service Department; guess I spent a lot of time in hardware stores anyway, so decided to make myself useful! Also, I work in parts supply at the Bellvidere Airport; work on my Acro Sport II suffers as a result. Only a retired fighter pilot would be so busy!

I started my Acro Sport II, SN 1044, in December 1986. In three years, all major parts were completed and engine installed. My good friend, Bill Konicek, who had completed a Baeking Duce was my technical advisor and did most of the welding. I quit farming in Iowa in 1990 and moved to Rockford, IL. We stored the plane for almost three years while building a house, airstrip, two hangars and a shop. Now it's back to work in earnest.



Dick Merkel's wooden "I" struts? - -naw!



Comm antenna mounting in left lower wing tip

I have made Oshkosh for at least a week each of the last 14 years. Much benefit came from forums, displays and especially campfire flying sessions. Most of my materials have come from the major suppliers — A/C Spruce, Wicks, Wag Aero, Alexander, Bon Aero and some others. Have purchased instruments from Century and wing tips from Ratray. Fly market always helped with ideas and small items, i.e. nuts & bolts. All wires came from A Wheels.

I have done a lot on the bird in the last year. A big stumbling block were the "I" struts. I had a friend weld them for me last fall. Now I'm working all my spare time prepping the wings for covering. It seems such a small job, but I'm finding many things to do to them. Recently put a comm antenna in the lower left wing tip and putting the pitot tube and plumbing in lower right was a big job. Upper wings are wired for lights installed in the tips.

I have some of that 2-part epoxy filler, Super Fil, and am finishing up the servos, using the filler to flesh out the trailing edges to match the curve of the elevators. It really works great, and I will use it to streamline the "I" struts as well.

Am in the process of building a paint booth in the shop. All previous painting was done outside, but perfection wasn't a criteria before as it soon will be. My paint scheme is not finalized. Have purchased a Croix CX-9 paint system. Works great the little I've used it. Plan on Stits for covering and finishing.

I have an O-320 engine - 1300 hours on it, out of a Tri-Pacer. I will have it overhauled in the next month or so. Haven't settled on a prop. Throttles, mixture and trim controls are finished - fighter pilot style. Mic buttons are in stick grips.

Benny Davis in Corydon, IA is building the fuel and smoke tanks for me. Should arrive tomorrow. I first made them out of cardboard for size and fit checks. Also, to check out the flush mounted fuel filler caps and side positioning.

I want to finish it by mid-summer but have lots of other demands. The only parts left to build are slave struts. I intend to have a canopy ultimately. Brackets are in place for hinges and hydraulic actuator.

I benefit from having most tools I need, but essential and most used are:

-Metal cutting band saw
-Small 1" x 30" belt sander
-Wood cutting band saw
-Dremel tool
-Gas welder
-Air brush
-Rivet gun & bucking bars
-Drill press & hand drill
-Good air compressor
-Bending brake

My airplane will be stock per the pink plans except for the following:

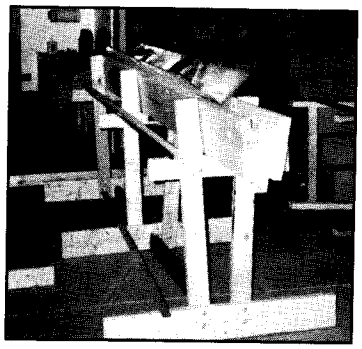
-Ailerons have scalloped edges inside
-The curved trailing edge of the upper wing center section does not extend into the wings
-Coil spring-type shock struts instead of bungee cord
-Battery platform behind rear seat
-No wobble pump
-Fuel sight gauge eliminated in favor of a capacitance type
-Gas tank and smoke tank have flush mounted filler neck 7" from centerline and will be accessed from a small door
-Comm antenna is in lower left wing tip
-Tail light is built into rudder

Enclosed are pics I thought might be of interest. I will gladly help anyone with discussions about any part of it. Many problems were encountered, but none that were not overcome by discussing at EAA meetings, (Marshalltown, IA Chapter), by just setting aside and coming back to or by dropping everything to design & build a jig solution or tool. Maybe I can write about specific items when I get time.

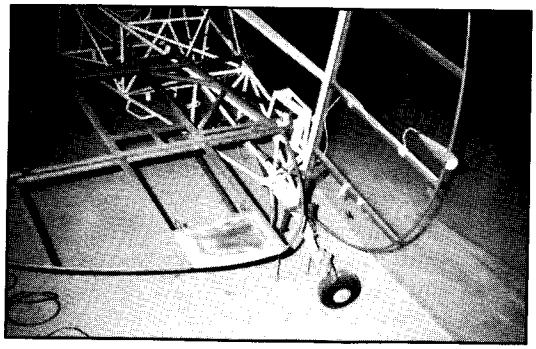
Thanks for keeping us all informed with a great newsletter!

Dick Merkel
10087 Cemetery Road
Pecatonica, IL 61063-9012

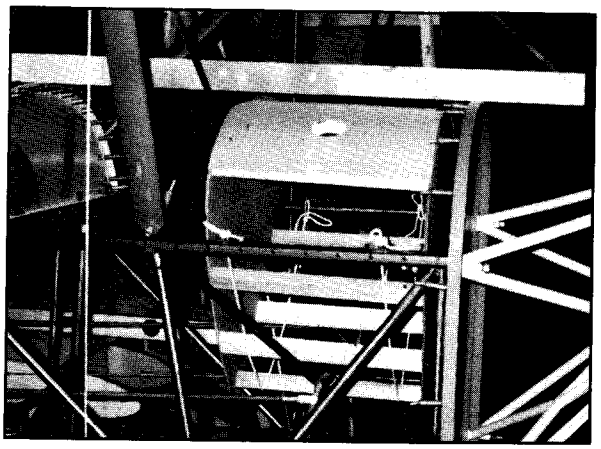
Jig for bending wing leading edges



Tail light mount and carefully fitted elevator servo



Mock-up of fuel tank to assure accurate fit in fuselage



ACRO SPORT

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