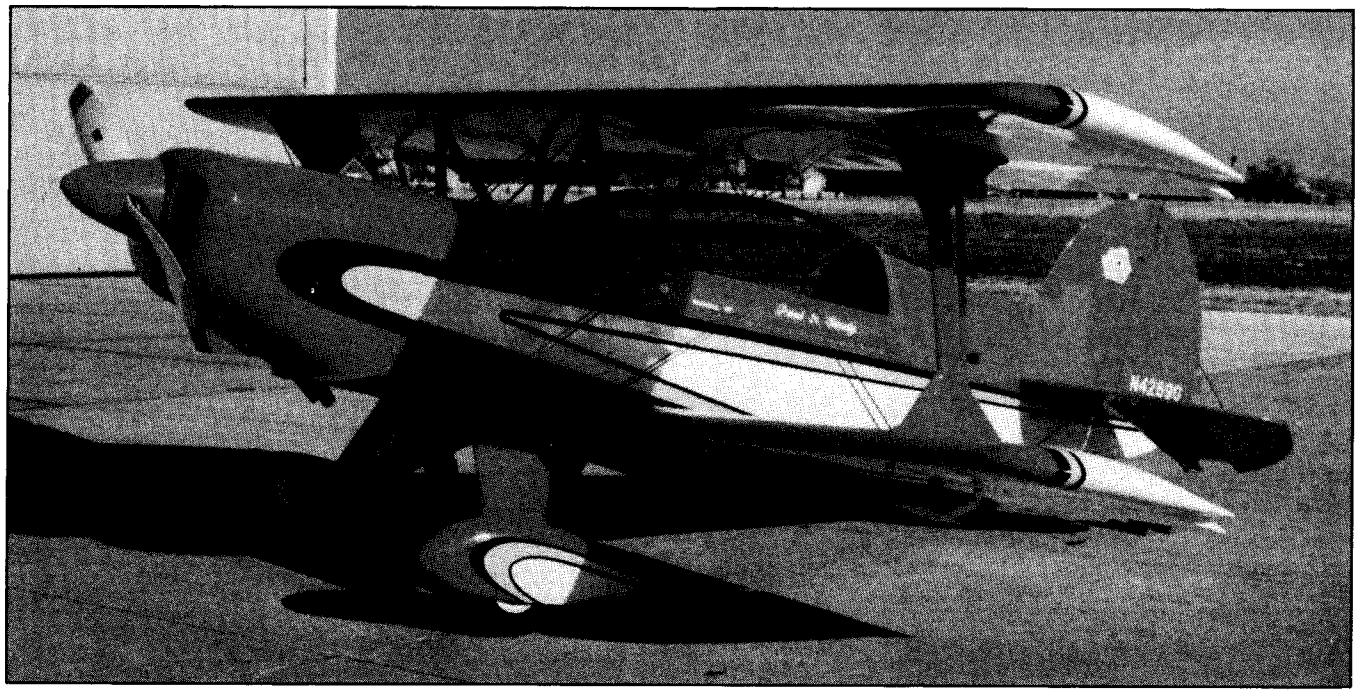
ACRO SPORT Newsletter

NO. 46 Printed by: TIMES PRINTING, INC. JUNE 1994



PAUL & SANDY MUHLE'S OSHKOSH '93 RESERVE GRAND CHAMPION AND OUTSTANDING ACRO SPORT II

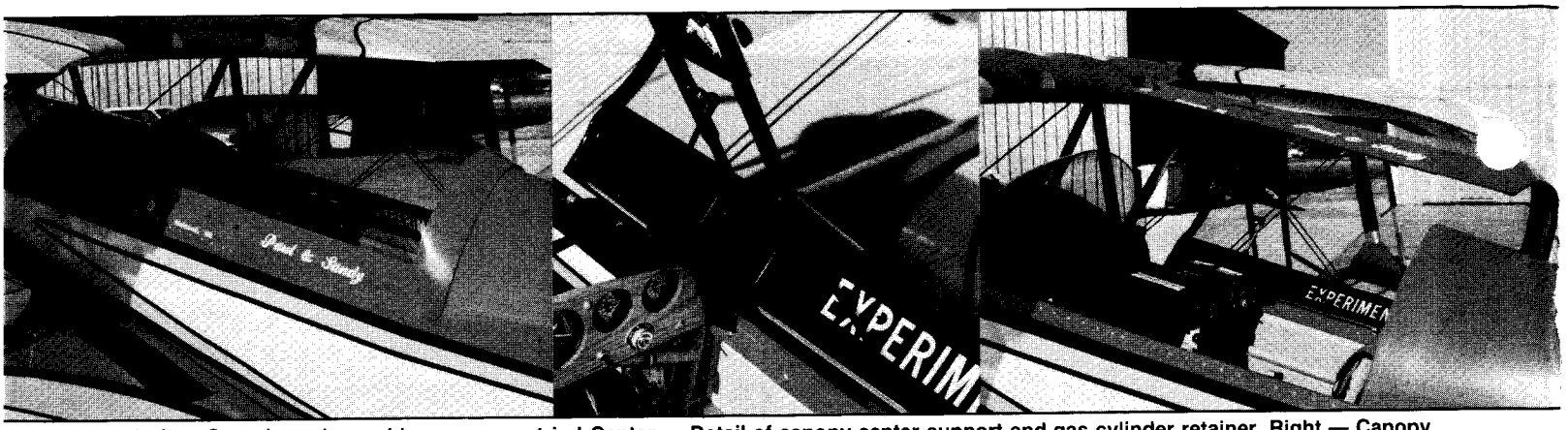
Dear Bill and Paul,

Thank you so much for the Acro Sport award at Oshkosh. Everyone was so nice, and we would have loved to stay for the Acro Sport Banquet, but we had to get home. We met a lot of interesting people at Oshkosh and enjoyed visiting with them. There were two things on the airplane that people commented the most about; number one was the canopy, which took a year and a half in itself to build. The other was so much simpler and easier to make; the shock covers.

THE CANOPY: If I had known beforehand how long it was going to take to build, I probably would not have attempted it, but now that it's done, I'm glad I did it that way. I was very concerned that it would either "make or break" the airplane. First of all, I made the canopy down to the top of the longerons, which cut some of my dash area down, but gave me more glass and better visibility. The canopy is constructed with a steel tube frame. I did some measuring and drew some lines on a picture of an Acro Sport on how I wanted the lines to blend in with the fuselage. I drew up a three-dimensional drawing of width, length, and height, and sent it to G. B. Canopies out of Seattle, WA. They made it accordingly. After I got the canopy, I rough-trimmed the plexiglass and set it on the airframe. From there I built a steel tubular frame around it, and covered it with .032" 2024 T3 aluminum, except for the rear part of the canopy which meets the turtle deck; it is a soft aluminum, 6061 .040". Behind the soft aluminum to keep it rigid, I laid fiberglass on the inside.

OPERATION OF THE CANOPY: There are two hinges on the outside of the canopy. These hinges are made out of nylon blocks with bolts passing through them to allow the canopy to slide back approximately 2" and break away from the wind screen. After it is pulled back 2", it swings over to the side and is retained by a gas cylinder. Closing the canopy is just in reverse: pulling the canopy down and pushing forward allows four pins on the canopy to slide into four bushings on the tops of the longerons.

BUNGEE COVERS: These were relatively easy to make out of fiberglass. Once the mold was built, fiberglass was laid up over it, set to dry, then cut directly in half to place on the bungees. To attach the two halves together, I used a Marlite splicer, (channel which

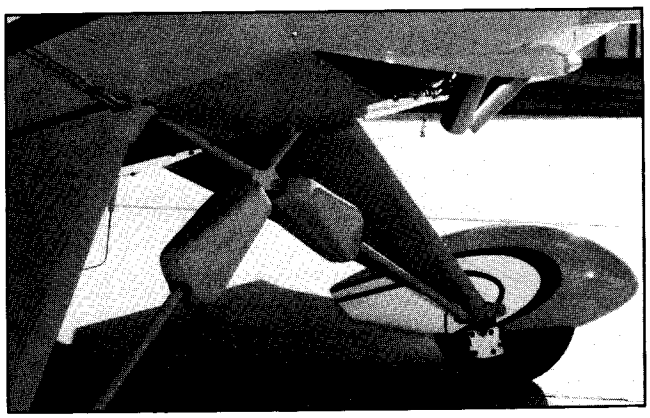


Left — Superb workmanship on canopy trim! Center — Detail of canopy center support and gas cylinder retainer. Right — Canopy solidly hinged to top longeron.

is used around tubs and showers); it is made out of plastic. I glued the splicers permanently on one side of the cover. The other cover is slipped into the splicer and is held together with silicone caulk. For inspection of the bungees, I use WD40 to squirt inside the crack which is siliconed; it attacks the silicone so you can take it apart without damage.

SPECIFICATIONS: Our aircraft is powered by an IO360, 180 HP engine. Empty weight is 1035 pounds. It cruises at 135 MPH; rate of climb is 1500 feet per minute with pilot only. It is covered with STITS HX 90 and painted with polytone on the fabric and aerothane on the metal.

FIRST FLIGHT: July 2, 1992, on a Sunday morning at 8:07 AM. I did all of my run-ups and had about 40 minutes of taxi time on the ground during the days prior to the real thing. Everything checked A-OK. All I could say to myself was: "I've got to do it and DO IT RIGHT!" So I eased the throttle ahead to about 65% power, broke ground, and did a gradual climb out. The airplane felt very good in the air, but the elevator was very sensitive. (I realized that from talking to Ben Owen a few days before. He told me two things: 1) the elevator will be sensitive, but feels very comfortable after you're used to it; 2) don't take off with full power; the airplane will fly off the ground soon enough!). With that in mind, I did not have a problem as I was climbing out. I was up about 500" AGL just over the crosswind runway when I thought I should scan my instruments. The first one I looked at was a fuel pressure gauge which read: "A BIG RED ZERO"! My reaction was, "Oh sh--!" Pardon my French. I immediately looked down for a place to land, thinking the engine would quit . . . two seconds



Fiberglass covers brought beauty to the "ugly duckling" bungees!

EDITORIAL/ by Bill Berrick

More about tail wheel flutter — I continued to have flutter after replacing the tension springs with Maule compression springs, which have a heavier spring on one side to dampen harmonics. A Technical Safety note by Larry Runge in the January '94 issue of SPORT AEROBATICS solved the problem. He quoted the Bellanca-Champion Club Newsletter:

"1. Replace the tail wheel tire and tube. Seven out of 10 times this will eliminate the shimmy without replacing expensive tail wheel parts that aren't broken anyway.

"2. The leaf springs weaken with time. This allows the vertical axis of the tail wheel pivot bolt to tilt forward at the top which induces shimmy. Replace the leaf springs until the bolt is vertical when a large person occupies the rear seat." I replaced the tail wheel with a Maule because my R&K solid tire was unevenly worn and not replaceable. Also, the tail wheel horns on the Maule are on top of the pivot bearing, giving a more direct pull for the connecting springs. I've had no more shimmy or flutter.

My one-holer AcroSport has now been through its second set of 1280 HD bungee cords, (two on each side). It was again squatting down with that tired look, even without the pilot on board, so that I hated to park it in front of the FBO where the guys could see the tilt and mention that it was taking on some of the appearance of the owner! I have now put two 1380s on each side and it is standing up proudly as a new colt. The negative side is that it now feels like the shock struts were welded on landing and as I roll out on our bumpy concrete runway! Please let me hear from some of you on what shock cords you are using on either the Acro I or II. If these don't soften with further use, I may try one each of 1280 and 1380 on each side. Perhaps my landings are so smooth, these new ones will never be broken in — NOT!

to ten seconds went by, and it's still running perfectly, so I told myself it has to be the gauge if it hasn't quit by now. So I continued flying for about 20 minutes and then approached to land. The first attempt did not feel just right, so I went around. The second time I landed without mishap! Boy did it feel good!! What a thrill!!!

As we are writing this, I have approximately 120 hours on the plane and about 20 hours of aerobatics. I am glad I built the Acro Sport II because it is a very fun airplane to fly, and very well designed — thanks to Paul Poberezny and everybody who is involved with the Newsletter for all their help. THANK YOU!

Paul & Sandy Muhle
Rt. 5, Box 236
Richland, NE 68601-8958
(402) 487-2702

Letters To The Editor

January 31, 1994

Dear Ben,

I have finally finished my Acro Sport II, S/N 1217 and am now waiting for the warmer weather to arrive, (it is now -22C. and beautiful sky). I received the last of the paperwork including my Flight Permit just before Christmas. Due to the busy schedule at home during the holiday, there was no time to get the first flight done before the cold weather set in. I have arranged for Paul Brooks from London, Ontario to do the test flying of my project. I moved the aircraft to London on September 19th and spent most of the Fall finishing trim strips and getting the engine to run successfully. I have kept records of my building from start, (March 1990), till Oshkosh, (July 1993). Since then, I've been working so hard that I neglected my record keeping and can only estimate the hours spent during the last four months. My estimate of the time to build is 2700 hours.

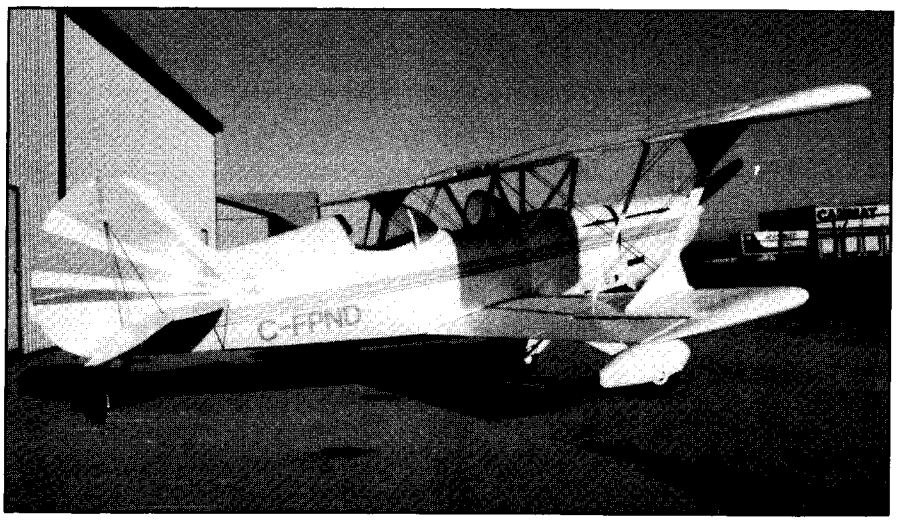
I had hoped to get my aircraft flying before February 28th, which happens to be my 40th birthday, but this does not look very promising. I always thought that when I finished my Acro II, I'd be all excited and wanting to jump in and go . . . unfortunately, I think I'm suffering from a form of "builder burnout". Too many hours of self-imposed confinement in the garage, and of late, long drives to London and back after work and on weekends have stripped away most of the fun . . . it became an obsession! I need to take this break! Paul Brooks has agreed with me to wait until March to start the next major phase of this project, test flying. I'm sure that my enthusiasm will return with spring and the excitement of learning the transition from Cessnas to a truly fun-to-fly aircraft.

I plan on putting together a summary of my building experiences and writing a letter suitable for the Acro Sport Newsletter. I have enclosed a photograph of my aircraft taken at London Airport in front of Paul Brooks' hangar.

I have written to Jean Kinnaman of Acro Sport, Inc. to let her know of my completion; perhaps she will be able to share my letter with Mr. Bill Berrick who is currently editor of the newsletter. Perhaps you could share this letter with Paul, and let him know the population of Acro IIs has just increased by one more! For the past few years, building has been a challenge and a source of excitement and satisfaction. I have been fortunate to have access to a good facility, knowledgeable and patient fellow builders, and an understanding wife, and a wealth of information and assistance from the EAA, yourself in particular. Many times when it looked like I'd "hit the end of a road," you gave me what I needed to figure my way out or a contact I could phone who could help me over the hurdles.

Thank you for all of your help and assistance,

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



Beautiful Canadian Acro Sport II by John Kafford!

February 7, 1994

Dear Bill,

My name is Ed Carris, and every time I get a copy of the Acro Sport Newsletter, I say I'm going to write to you — this time I am making the effort!

I started my Acro Sport I in January 1990 after receiving the plans for a Christmas present from my wife. It is a hobby for me, and I put what money I can into it — and who knows, someday I may have an airplane.

I read in your editorial about wingtips. I have have found that a lot of suppliers have wingtips for the Acro II but do not have them for the Acro I. I wrote Rattray Aero Products Co. about them for the Acro I, and they never answered my letter. So this is what I did: I glued blocks

Ed Carris' Acro I.

of polyurethane foam onto the wingtips, then I carved the wing tip shape using a hacksaw blade to get the rough shape and one of those hardware store foam sanding blocks for the finish work. (Be careful: polyurethane sands away fast!) Then I covered them with two layers of "E" glass using a product called Alphapoxy for the resin. You get four nice wingtips that fit for less than $100.

Now for my questions: Does anybody make a good fuel tank in the 20 gal. range that will fit the Acro Sport I?

I read in the Newsletter about serial numbers for the Acro. My plans, (red cover), have no serial number listed anywhere. How do you get a serial number? Does anyone really know how many Acro Sport Is are flying?

Enjoy the Newsletter very much. Sincerely,

Ed Carris
211 Woodlake Drive
Jupiter, FL 33458

Rattray Aero hadn't answered your letter because they were getting out a new

catalog or flyer that they intend to send you. It is a moot point for you now, but he does have wing tips for the one-holer.

I don't know about the fuel tank source; the outfit in Ohio that made mine is no longer in business. It has been OK so far, but does not have stiffening "ribs" pressed into the front and back to avoid "oil canning" motion that could cause cracks. My ends bulged out during pressure testing, and seem to have kept that form. Anyway, I've had no leaks or cracks to date.

The Acro Sport I plan serial numbers 1-129 had orange covers; numbers 130-486 blue covers, and some later ones were yellow. I just don't know about a set with red covers, and I believe a new numbering system may have been used after Paul sold the plans to Acro Sport Inc. There are corrections and revisions to some of the earlier plans that were published in early editions of the Newsletter and in Sport Aviation from 1975 through 1980.

As you probably know, a plan serial number is not needed when you register your airplane with the FAA. You can give the airplane any serial number you wish, like No. 1 if this is the first one built by Ed Carris Aero.

The latest count of Acro Sport I completions that I have, (from Ben Owen), is 49 as of the end of 1992. There were 71 Acro IIs known completed as of November 1993. — Ed.

Dear Paul,

Remember this gang — I'm the one with the beard. Many thanks for your friendliness; in 1976 you also took the time to let my then nine year old son have his picture made with you.

After waiting a few years, I am finally the owner of plans set N-15. I think it was 1989 I first saw the welded but uncovered fuselage at Oshkosh and became interested in the Pober Junior Ace. I have thoroughly enjoyed studying them and am much impressed with the "keep it simple" design. My interests have always been "low and slow," "tube and fabric". I hope many others will also welcome this addition to the field.

My background is 450 hours in the Cub and Champ I owned. I've not been flying actively since 1970 due to the 320 tuition checks I've written, (no regrets, they are fine boys)! We're looking to the Junior Ace for wings again. I will be retiring in about 18 months and plan to build at that time; naturally, I would like to fly in her if at all possible.

Thanks for your time. I know you are quite busy.

William L. (Bill) Metz, EAA 23313
604 Isaqueena Drive
Greer, SC 29651

Le Ier/02/1994

Dear Sir,

My home-built Acro-Sport II No. 602 will be finished in a few weeks. Before flying, the French Administration requires some elements not available on the plans set. My Centre of Gravity is situated 8" ahead of the lower wing leading edge.

Could you tell me please:

1) What are the loading limits, (backward/forward)?

2) V.N.E. (Velocity Never Exceed)?

3) The different values of tension, (Lbs):

Stab upper wires; stab lower wires; landing wires; roll wires; real flying wires; forward flying wires.

With many thanks in anticipation.

Yours faithfully,
Mr. RATEAU Jean-Pierre
Les champs Renauds
03240 TRONGET

Dear Jean-Pierre:

Thank you very much for your letter. Acro Sport, Inc. sent it to me for the information that you requested.

I am enclosing two documents that will give you the necessary information you need relative to flying wire and landing wire tensions, as well as the forward and rearward CG limits. In fact, I have enclosed a copy of the weight and balance of the prototype Acro Sport II, which has now flown some 350 trouble-free hours.

French-built Acro II by Jean-Pierre Rateau!

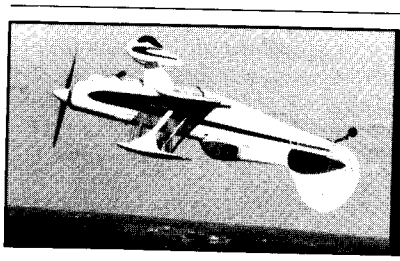
Regarding the never exceed velocity on the airplane, it had been tested to 160 mph and was designed for 5 G's positive and 4 G's negative.

I do not know if you subscribe to Acro Sport's newsletter. You might write to them if you don't as you might find it very helpful. I am enclosing a copy of one of their latest issues.

Keep us posted on the progress of your beautiful airplane. You will find it to be a delight to fly, with no bad habits. It's ground handling is particularly good.

Sincerely,
Paul H. Poberezny

Roland Roy, Augusta, Maine; Bill Metz, Greer, S.C.; John Quarles, Madison, AL; Paul Poberezny, Founder of EAA.



INVERTED FLYING IN THE ACRO II

by Don E. Baker

In order to get the most enjoyment out of flying aerobatics in the ACRO II or any other airplane, it is essential to become very familiar with and comfortable with the inverted attitude. Inverted flight should be the first aerobatic maneuver learned because any other maneuver which you attempt first could be botched and leave you in some unpredictable situation. The probability of finding yourself flat on your back can be quite high in a botched maneuver, and familiarity with the inverted attitude keeps the panic tendencies and further screw-ups to a minimum. In other words, I believe in a systematic approach to aerobatic self-education, to minimize risk and maximize the probability of success.

Of course, unless you have some incredibly special talents, it is impossible to get inverted without doing some kind of aerobatic maneuver first. I would recommend a half roll, at cruise speed, at an altitude you feel comfortable with, and with the power setting unchanged. Do not mess with trim settings or anything else, just roll over, stop the rotation with wings level, and concentrate on maintaining the attitude. If it is your very first inverted flight, you will be too emotionally involved with the situation to notice much else. The single most important thing at this point is to not let the airspeed get away from you. This is best accomplished by limiting the first inverted flight to a few seconds duration.

Increase the inverted flight duration in steps until you can concentrate on actually flying straight and level. This means keeping the wings level, keeping the airspeed constant, being able to briefly look around, scan the instruments, etc. This should not take more than a dozen or so short inverted sessions. Keeping airspeed under control is critical because an inverted stall wouldn't be good here and neither would exceeding red line speed. Also, when you are ready to roll back right side up, it is good to be around cruise speed, a really safe speed for you and the airplane. This may sound trivial, but the first inverted flying is so enthralling and mind consuming that major changes in airspeed can occur before you know it. I have found, on a clear day, that the top wing should be right through the horizon when tightly strapped in the seat, at cruise power setting. This will put the nose substantially above the horizon and the view out the side will show the wing incidence angle relative to the horizon to be greater than zero. By the way, I did mention that the seat belts should be checked for tightness before-hand didn't I? Open cockpits, inverted flying, and loose seat belts don't mix well!!!!

First inverted flights are exhilarating and you finally get your first sustained negative one-G without using your arms or head for support . . . wow! What a rush! I will never forget that day as long as I live! Aerobatic flying really is the neatest thing that a person can do, PERIOD! End of statement! As you progress, you should be able to keep altitude and airspeed constant without too much attention to instruments, just like right side up flight. Extended inverted sessions, spanning several minutes, may be more comfortable with a slight amount of down trim to offset the elevator pressure. My longest inverted session is around 20 minutes, no big accomplishment, but it was fun.

By the way, keep in mind that sufficient fuel must be aboard, as well as a good, limber flop tube for inverted flights beyond a half minute or so. The ACRO II tank/flop tube design will not draw fuel in the inverted attitude with less than about 10 gallons aboard. I knew that, but still managed, (twice), to have the engine quit while inverted. A quick roll upright is in order, followed by stroking the manual pump until the engine resumes power. In both cases the propeller continued windmilling, however, several seconds can be lost before fuel reaches the engine again, (no matter how fast you pump), so don't get in this situation close to the ground!

Next work on turns, starting with gentle ones in either direction. Think in terms of pushing the nose in the direction you want to go, this will help you in rolling the correct way into the turn. Right side up you pull the nose around a turn; inverted you push it. Note that rudder is necessary to keep the nose on target as you begin the roll; opposite rudder. Good coordinated rudder seems the hardest thing to accomplish when flying inverted, because of the tendency to tense up your legs on the pedals. Try to concentrate on relaxing and feeling the rudder pressure as in upright flight.

Actually, nothing is reversed during inverted flight except the rudder for coordinated turns. If it helps, remember that whether inverted or right side up, always use bottom rudder to coordinate turns. This is in contrast to the top rudder used during axial rolls. Another interesting rule is that if you want to turn toward an object, you move the stick, (aileron), toward the object when right side up, and away from it when flying inverted. I really don't like little rules like this because it should be automatic in your head; it takes too long to remember and execute rules. they are handy though, as "training wheels" when first learning.

Next, try some climbs and dives to get the feeling of more than one G negative. Concentrate on keeping heading and returning to original attitude. Practice 45 degree climbs and descents. Remember, for straight and level inverted flight, how the nose was significantly above the horizon? The wing's angle of incidence relative to the horizon for inverted level flight, is also significantly greater than zero. Thus, for inverted 45 degree climbs, the wing and fuselage angle relative to the horizon as viewed out to the side of the aircraft will be greater than 45 degrees. That is, the leading edge of the wing will appear above an imaginary 45 degree line relative to the horizon for a true 45 degree climbing course. On a 45 degree dive, the leading edge of the wing will also appear above an imaginary 45 degree line relative to the horizon. Interesting how that works out, don't you think?!!!! Like I said, flying really is neat!

Now that you have inverted turns, climbs, and dives mastered, you should be getting comfortable with inverted flight. The only thing needed now is practice, practice, and more practice, and you will soon become good at it. Don't do any of this close to the ground or next to anyone else flying, (maintain 1000 feet or more separation), until you can do it all automatically and correctly without thinking. This will take many hours of practice, but that's what it's all about, right?

After you get proficient at rolls, come back to inverted practice and work on rolls beginning and ending inverted. Work the four point and eight point rolls also. Now you are ready to string some of these maneuvers into a little inverted practice sequence. Put in some 90 degree turns, full, ¾, ½ and ¼ rolls and so on, but keep it mostly inverted. Practice it beginning with a known heading and try to end up on the planned heading. Keep working it until you get it right consistently. Try a mirror image version and get it right. Thinking, navigating, and maneuvering all at the same time during inverted flight is harder than it

SUN & FUN NOTES:

The Forum had 16 attendees, up from 11 in 1993.

THANKS from Acro Sport, Inc. to Moderator Wally Weber, Panelist Robert Callis, and to Bill Blake for his support.

A BIG THANK YOU TO ALL OF THE VOLUNTEERS THAT MAKE THE OSHKOSH AND SUN & FUN FORUMS AND JUDGING POSSIBLE.

CLASSIFIED ADS

Wanted: To buy materials for an Acro Sport II from abandoned kits. Call Remco at (201) 487-5550.

Wanted to buy: Acro Sport II, completed or project! Call or write Jim Morgan, 1902 Snowdrop Circle, Liberty, MO 64068, (816) 781-4364.

ACRO SPORT

P.O. Box 462 Hales Corners, Wisconsin 53130 414/529-2609

BULK RATE
U.S. POSTAGE
PAID
PERMIT NO. 1
RANDOM LAKE, WIS.
53075

COMP
Neil Sidders
235 Rowland Road
Monroe, LA 71203

Be sure you get all ACRO SPORT NEWSLETTERS by keeping your subscription current. The NEWSLETTER contains a wealth of building tips that can save you a lot of time and money, while keeping you advised of what other builders are doing — including their many constructive comments and suggestions. Renew your subscription now to the quarterly ACRO SPORT NEWSLETTER — $12.00 annually.