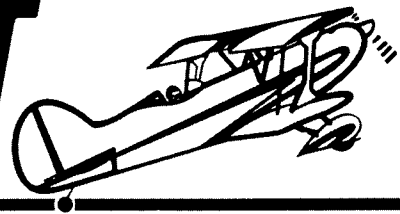


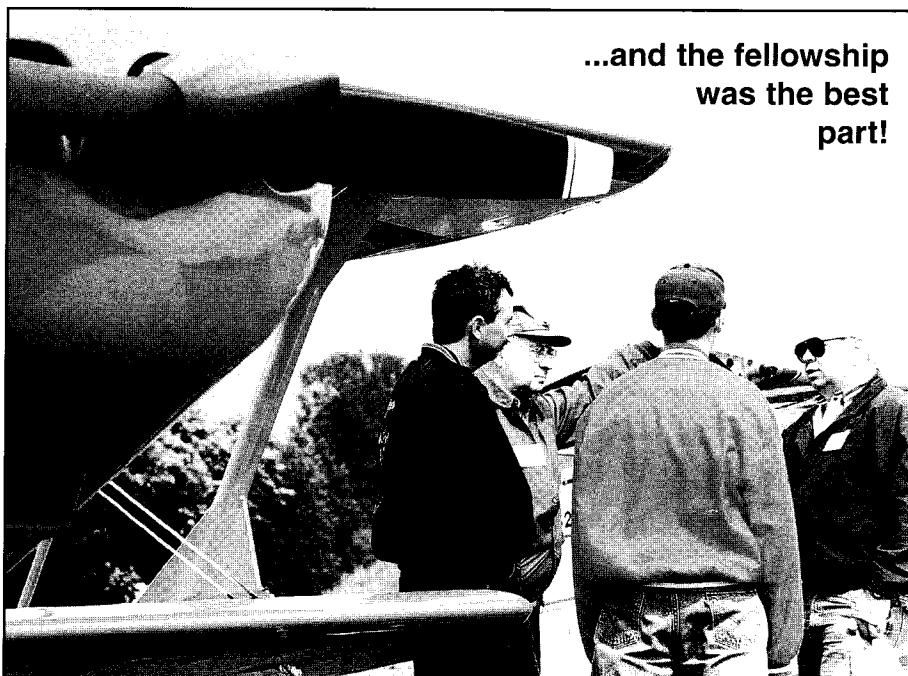
ACRO SPORT Newsletter



NO.62

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SUMMER 1998



by Ben Owen

We had nine aircraft at the fly-in, We had bad weather which slowed down a lot of people but our congratulations to H.W. "Skip" Egdorf, a scientist from Los Alamos, New Mexico. Skip flew an 8 hour

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Wally Weber's colorful Acro II.



Lee Farnsworth, Racine, WI is a retired engineer and did many corrections on the early Acro II plans.



flight in his Piper Cherokee to reach the event! His was the longest aircraft trip although we had Acro Sport builders from New York state and Louisiana also.

Ray Wilkes of Ottumwa, Iowa flew his Cougar in. Ray had some problems with the glue on the wood wings and replaced the wing with a metal wing of his own design. It is a very attractive airplane.

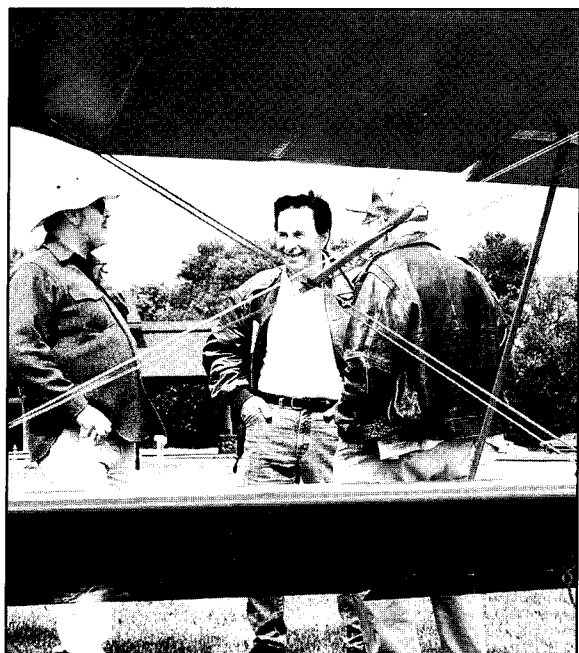
Recognized as the most outstanding finish is Wally Weber's Acro Sport II, N819WW. He and his two sons and grandson brought the Acro Sport II and a very nice 1979 Citabria. Wally's son, Steve, assisted in the construction of the Acro Sport II and used the time to get his A & P license. Wally's other son, Paul, also has a hand in the construction of the aircraft and Steve's son, Adam, age 18, is carrying on the family tradition of building and flying.

We were fortunate to have Tom Plodzein fly in from Chicago in an Acro Sport II, N89CT. The builder of this aircraft was Frank Rossner. Tom was able to correct some minor rigging problems with the aircraft and has also installed lower wing metal aileron seals increasing his cruise speed by 5 mph and also reducing his stall speed. He also raised the horizontal stabilizer leading edge about 7/8" which is a recommended mod for all Acro Sport II builders. He has also installed a Pitts S-2 canopy and frame making the airplane much more useable in winter weather.



Rex Ott, wife and son flew in with their Beechcraft Musketeer. Has his Acro II completed but flight testing is still underway. A sign posted in his aircraft tells all!

Right- A few of the happy attendees at Pioneer Airport June 6, 1998, standing in front of Lee Farnsworth's Acro II.



Left- Important Acro Sport II matters under discussion! Left to right-Skip Egdorf, Los Alamos, NM; Tom Plodzein, Chicago, IL; and Lee Farnsworth, Racine, WI talk things over.

Photos by
Chris Kinnaman,
Ben Owen, Norm
Peterson and Mark
Schaible.

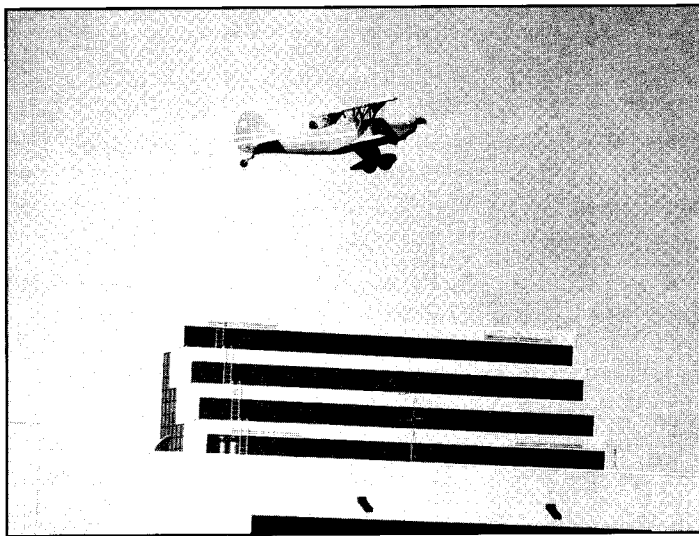
Jim Lund flew in with this beautiful Avid Flyer.
Subaru engine installed



Tom Plodzien's Acro II featured a full canopy and
aileron gap seals.



Ray Wilkes and his Cougar. More about this
unique aircraft will be presented in a future issue



Lee Farnsworth climbs out of Pioneer Airport
with the EAA Air Adventure Museum and EAA
headquarters as a backdrop.





Above—Ben Owen kept things under control around the vast Pioneer Airport complex in this cut down VW Beetle—a familiar vehicle at the annual EAA convention



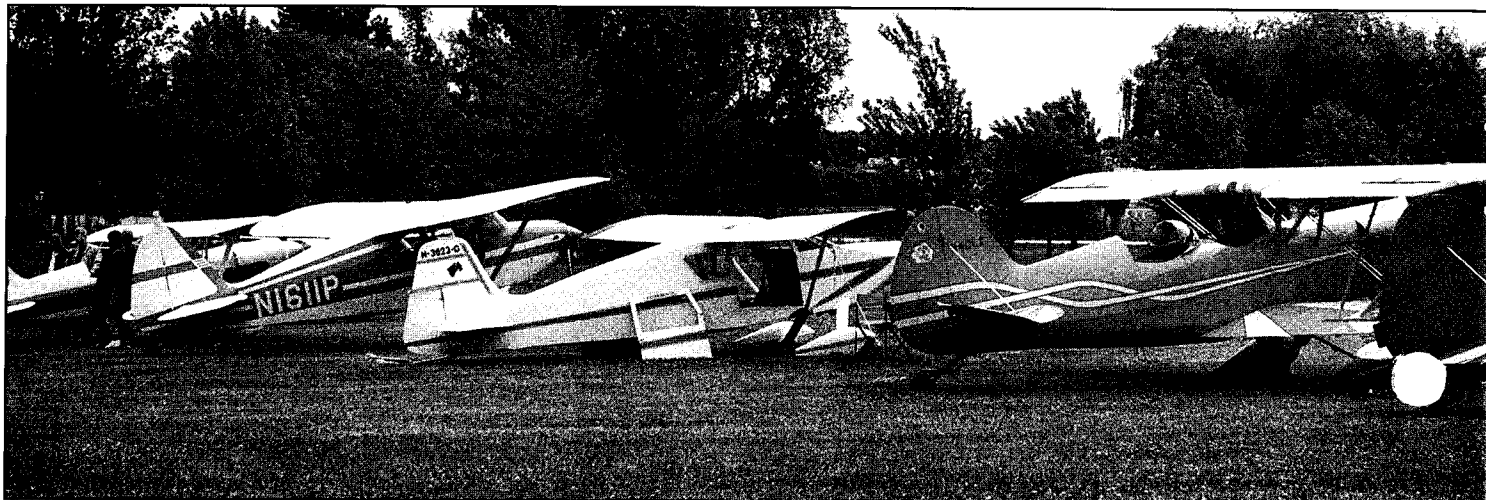
Left—Lee Arnsworth talking “how-to” to a group of fellow Acro Sport builders.



Above—EAA’s Joe Schumacher, right, points out Pioneer Airport’s various hangers to a couple who have driven in to attend the Acro Sport Fly-In.

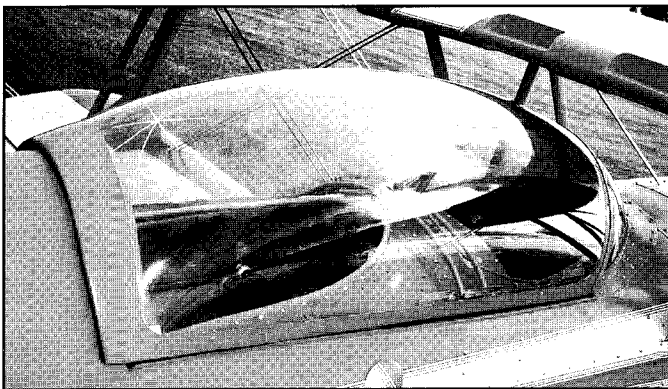
Left—What could be better than a grass strip in which to hold a fly-in?

Below—A great collection of aircraft on display and the perfect place to get tips and info direct from the builder!

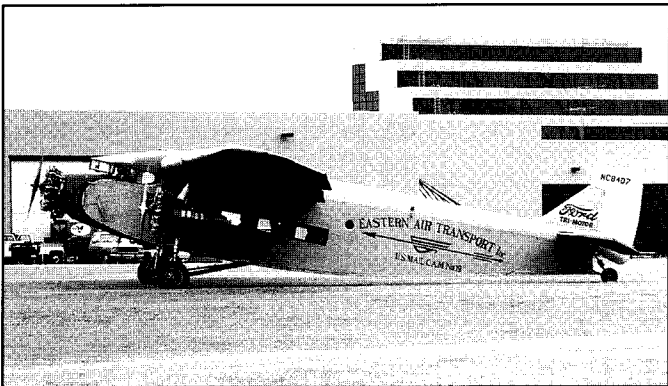




Ben Owen, Wally Weber and sons, (and grandson), with Wally's Acro II.



Tom Plodzien adapted a Pitts canopy for his Acro II — for more comfortable Chicagoland winter flying



EAA's stately Ford Tri-Motor added a bit of nostalgia to the event.



Fly-Ins...

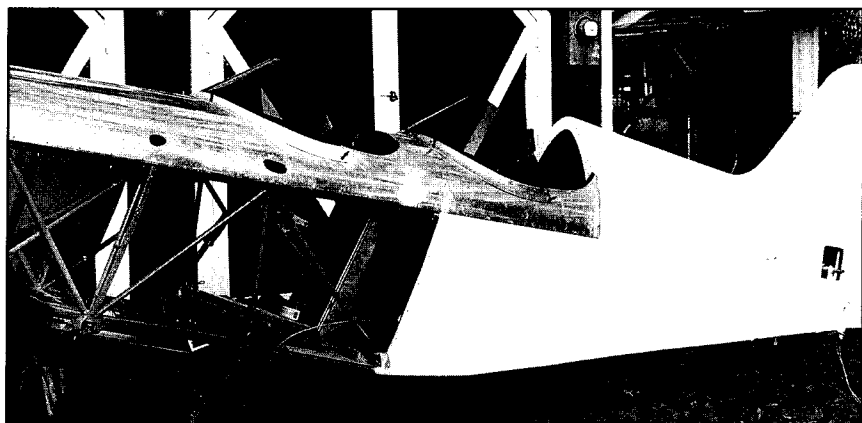
BRYAN JENSEN	3564 WILLOW BEACH ST., PRIOR LAKE, MN 55372 12-2-97	345288	AS II	DIDN'T COME
RAY WILKES	11 SCHWARTZ DRIVE, OTTUMWA IA 52501 11-17-98	64261	COUGAR N3623G	FLEW IN W/LARRY COFER
BILL BERRICK	11803 HUNTER'S COVE, OMAHA NE 68123-1119 12-1-97			DIDN'T COME
REX OTT	14794 205 AVE., DANVILLE, IA 52623 12-8-97 IF HE GETS IT DONE	313092	BEECHCRAFT MUSKATEER N4012T	FLEW IN WITH JOANNE & RAY
FRANK JOHNSON	10318 WOODS EDGE LANE, FORT WAYNE IN 46804 219-436-3690 **WOULD LIKE TO PARK AT THE PIONEER AIRPORT		AS II	DIDN'T COME
KENNETH DANNENBERG	ARRIVING JUNE 5 TH AND LEAVING THE EVENING OF THE 6 TH WEATHER PERMITTING 4282A 46 TH ST. HOLLAND MI 49423-9596	4111	NESMITH COUGAR N42KD	DIDN'T COME
TOM PLODZIEN	FLYING IN, BUT IF WEATHER BAD WILL DRIVE IN 1904 W FULTON ST. CHICAGO, IL 60612-2404	274778	AS II N89CT	FLEW IN
LEE FARNSWORTH	2409 ERIE STREET, RACINE, WI 53405-43	129869	AS II N40LF	FLEW IN
JOHN WING	315-387-3111 2745 CTY ROUTE 2, RICHLAND, NY 13144-4463	162537		CAME-DID NOT FLY IN
PAUL FELKNER	RT 2, BOX 64 CENTERVILLE IA 52544			DIDN'T COME
MIKE LUTZ	14989 TOWNSHIP RD. 45, FINDLEY, OH 45840-9262 FLYING IN, BUT BRINGING HIS SPEARMAN SPECIAL. ACRO NOT DONE	72195	SPEARMAN SPECIAL	DIDN'T COME
SKIP EGDORF	18 VILLAGE PL, LOSA ALAMOS, NM 87544-3746 FLYING IN BUT BRINGING CHEROKEE, ACRO NOT DONE YET 505-665-1087 WORK PHONE NUMBER	334673	CHEROKEE N8849W	FLEW IN
TOM DE WINTER	WITH WIFE AND THEIR C172, 305 E. 11 TH , COAL VALLEY IL 61240-9589	222721	AS II	DIDN'T COME
JOHN LEITIS	817 ROOSEVELT AVE, ROARING SPRING, PA 16673-1908 814-224-2465	79903	PIXIE	DIDN'T COME
RON PALASCAK	57 WOODVIEW LANE, ALQONQUIN, IL 60102	15081	AS II	CAME-DID NOT FLY IN
WALLACE WEBER	16722 HASTINGS MN; ALSO FLYING IN A CITABRIA	16733	AS II	CAME W/ PAUL, ADAM & STEVE WEBER
JIM STOOPS	2152 CLOVERLEAF SCHOOL ROAD, BELLEVILLE, IL 62223-7001	130921	AS II N44JS	DIDN'T COME
JIM LUND			AVID FLYER N251SL	FLEW IN
ROBERT RUMBAUGH	1-460 CTY ROAD D, DESHLER, OH 43516	341222	PACER N1011P	FLEW IN W/BILL RUMBAUGH

Drive Ins...

DAVE NICKEL	210 N. EMERSON, MT PROSPECT, IL 60056-2510 847-398-5324	289720	DIDN'T COME
DAVE LUCAS	5099 ILSEVIEW DR., CHESTERFIELD, MO 63017-7608 314-532 2898 HOME 314-432-6330 WORK	462347	DIDN'T COME
DOUG APLAND	21464 40 TH AVE, CHIPPEWA FALLS, WI 54729-9191 715-834-1131 BE HERE FRIDAY, TO HELP OUT, OWNS ACRO II	245964	CAME W/ JO ANN & MAX
MATT FERRARI	532 14 TH AVE, TWO HARBORS, MI 55616 PHONE: 218-834-3463 HIM, HIS WIFE AND THEIR YOUNG DAUGHTER	408488	CAME W/ANN & KAITLYN
DERRICK BODDY	41 W330 BEITH RD. ELBURN, IL 60119-959 DERRICK PLUS 2 OTHERS WILL BE DRIVING IN 3-19-98	349946	CAME
GARY K KRAUSE	DRIVING IN (2 PEOPLE). 9 WILTON STREET, GREENVILLE, SC 29601-1519	347302	DIDN'T COME
PERRY CARTWRIGHT	DRIVING IN, 5480 S RIDGEWOOD COURT, CHICAGO, IL 60615 TELEPHONE, 773-702-6096, FAX 773-702-9756	423041	CAME
ROBERT RUMBAUGH	ARRIVING SATURDAY MORNING. 1-460 CTY ROAD D DESHLER OH 43516	341222	FLEW IN SEE ABOVE
RICHARD BERTSCHINGER	5496 N. STRATHMORE, MILWAUKEE, WI 53218-2944 OWNS ACRO II	103872	CAME
NEIL SIDDERS	235 ROWLAND ROAD, MONROE, LA 71203-8502, WIFE & 2 CHILDREN AGES 8 & 11 COMING WITH, OWNS ACRO II	202857	CAME W/DEBBIE BECKY & LAURA
MARK MAXSOM	5803 S 28 TH , KALAMAZOO, MI (CAMPING-BRINGING CAMPER) (2 PEOPLE) OWNS POBER PIXIE-NOT QUITE DONE	154750	CAMF
CHARLES TUCKER & KATHY FINGALSON	ACRO II OWNERS; RT 1, BOX 124E, CALLAWAY, MN 56521, 218-375-2992	329713	CAM
JOHN KECK			CAN
KEN PATSCH	8607 ST RD 61, BERLIN HTS, OH 44813, 419-588-2554, OWNS ACRO II	480071	CAN
JEAN & CHRIS KINNAMAN	ACRO SPORT, INC PO BOX 462, HALES CORNERS, WI 53130 414-545-7794	68524	CAN
TIM & MICHAEL GALLAGHER	7749 HALE DRIVE, CHERRY VALLEY, IL 61016	386966	CAN
BEN & BETTY OWEN	EAA STAFF, OSHKOSH	19702 570348	CAN

Windshields - And How To Form Them

by Neil Sidders



O.K. You've spent all this time building your open cockpit dream ship and now it's time to decide on a windshield. You basically have 3 styles to choose from. Flat wrap, bubble, or multi faceted. Sometimes the character or the airplane will help you decide the style of windshield you will use. Look at the Hatz. A flat wrap looks fine, but it's such an antique looking design that a multi faceted windshield really looks great. But just try to imagine a Pitts Special with a multi faceted windshield. It just doesn't fit the character of the Pitts the way a bubble or flat wrap does. Sometimes a need for a new twist on an old style comes along. The most recent example of this is the MG-2 that Jim Moss rebuilt. The 5 panel windshield on this airplane became a key styling feature that helped bring it's many other great features together. Yes, I really like the MG-2!

As much as I like the multi faceted windshield, I think they should be reserved for airplanes with narrow head rest on top of round, stringered fuselage backs.

My own choice for my Acro Sport II was now narrowed down to a flat wrap or bubble. I like the bubble, but there is always a chance of distorting the optics when the bubble is blown. This makes good quality bubbles cost more than I think they should, so I decided to make my own.

Someone once told me (I think it was Ben Ellison) that reducing drag on a biplane is like throwing pebbles in a pond to drain it. I think there is probably a lot of truth to that, but if I wanted something fast, I would not have built a biplane. At the same time there is no point in making it slower than it has to be because of a poorly fitted windshield.

Any open cavity is a tremendous drag producer. Barnaby Wainfain had a good article in "Kitplanes" a few months back that addressed this. From that article we learned that the bubble style might have a slight advantage over the flat wrap where the air leaves the edge of the windshield at the top. The only real hope for reducing drag is to reduce the size of the opening and using a steeply sloping windshield that extends back as far as possible without making it difficult to

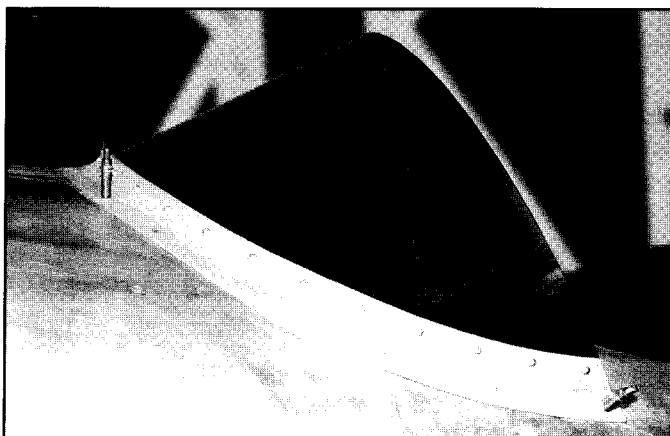
get in or out. The rear windshield should be slightly higher to help deflect the down wash from the top wing that seems so intent on pounding the pilot. I think the rear windshield should be as tall or taller than the turtle deck in hopes to reduce the drag that could be produced by the large head rest area used on the Pitts, Skybolt, Acro Sport type designs.

After 6 or 8 different patterns, taping them in place and climbing in and out of the cockpit a few times, the two patterns in the drawing were deemed proper. These patterns were transferred to 1/8" acrylic (plexiglass) sheet. Polycarbonate (lexan) could have been used, but it scratches more easily and is more prone to turning milky. Polycarbonate is used in the auto industry for head light lenses because it is easy to mold and is very durable. The scratching problem is eliminated by a hard coating process that is expensive and not generally available outside the industry. The early plastic lenses were actually a composite of acrylic molded over polycarbonate. The neat thing about polycarbonate sheet is that it can be bent in a sheet metal brake making it possible to build a multi faceted windshield without the need of a complicated frame.

After the pattern was transferred to the paper backing on the acrylic sheet, I used a band saw with a fine tooth blade to cut out the windshields, then sanded the edges smooth with a belt sander. While the paper is still in place, it's a good time to round the edge that will be exposed. I just used a sanding block by hand and finished up with #600 paper.

The method used for forming is straight from one of Tony Bingelis' books. I made a form consisting of two identical formers with a 12 inch radius (see drawing) and covered it with aluminum. The problem came in finding an oven large enough to heat this much plastic. When you're at a loss as to what to do, call the Preacher! In this case that meant Bro. Dave Fortuna, fellow EAA member and very resourceful individual. Another church member, David Key is in the silk screen business and he has this big oven he bakes the shirts in to dry the ink." I bet he'll let us use it" says the Reverend.

The way the oven works, it has a bank of heating elements in top and a conveyor the shirts travel on. As it is designed, the conveyor runs any time the heat is on. This feature kept the plastic from being heated enough before it came out the other side. What we did was fold an old sheet to the width of the conveyor so we could hold the plastic in place under the heating elements. I cut a piece of cotton flannel large enough to lay the plastic on and then put them on the folded sheet. We let this travel on the conveyor until the plastic would be completely heated by the oven, then kept it in place by holding on to the sheet. We found it helped to heat soak the plastic if we covered the ends of the conveyor. We ran oven at 250-F and it seemed to work well. I don't know how accurate the thermostat is so, you might



continued on page 10

G-OJDA Acro Sport II Plans# 883 Progress Report

By David Almey /Kestrel, Broadgate, Weston Hills, Spalding, Lincs, UK, Fax 00 44 14 1406 371779

When it's stood on its wheels, it's half done. Well, G-OJDA has been on and off its wheels for the last six months, and I think it might just be halfway. I haven't counted the hours or the cost so don't even ask, I don't want to know. Neither does Jane, wife, tea-maker, and number one supporter. (That's what the "J" is for in the registration).

Compared with most homebuilders, I am very fortunate. I have a 30X35 ft. workshop adjoining my company's premises with all the bits and pieces you could nearly ask for. I am amazed at the results some builders achieve in very basic workshops.

When I started G-DA I bought it from Roy Hodder, who after starting changed his mind and built an Acro Sport I. I couldn't understand the decision then, perhaps I can now. I worked on the bits I had bought from Roy until I went to Oshkosh 96. It was well evident then, that if I was going to make a good plane I would have to think again. I also decided on the flight home I needed to call it the aircraft I had built, not the one I had finished.

Construction restarted on 11 October 96. I started again completely from scratch. Progress was good, and wings were soon well underway. I used Birch plywood throughout and machined my own spars and capstrips

from BSV 37 spec spruce boards. I had all the metal wing fittings Cadmium plated and I roll threaded my own drag/antidrag wires. I knew that weight was going to kill this aircraft unless I really paid attention to detail, so all excess glue was wiped off, no nails used and the few staples I used were removed. I was once told all the nails in the Spruce Goose amounted to 3 tons, don't know if it was correct but not an ounce was going to be added to this plane. I was given a set of Wag-Aero fiberglass wingtips but was horrified at the weight - just over 5 lbs. each. Molds were soon taken from these and a set of 4 epoxy resin, woven cloth tips soon appeared at 1 3/4th lbs. each. Not bad - 13 lbs. saved in 4 days! I don't like aluminum parts nailed onto timber wings, they always end up with dents, kinks, and lifting nails. The wing and aileron trailing edges were made from 0.8mm birch plywood, with a triangular timber trailing edge section and a forward brace between the ribs. This is the same as used on most European timber sailplanes, immensely strong and very light. Aileron shrouds are all plywood with really sharp trailing edges.

The wing leading edges gave me a lot of trouble. Alloy was out of the question. I tried plywood in various thicknesses on one of the earlier wings. The shape was fairly easy up to 1/16 ply

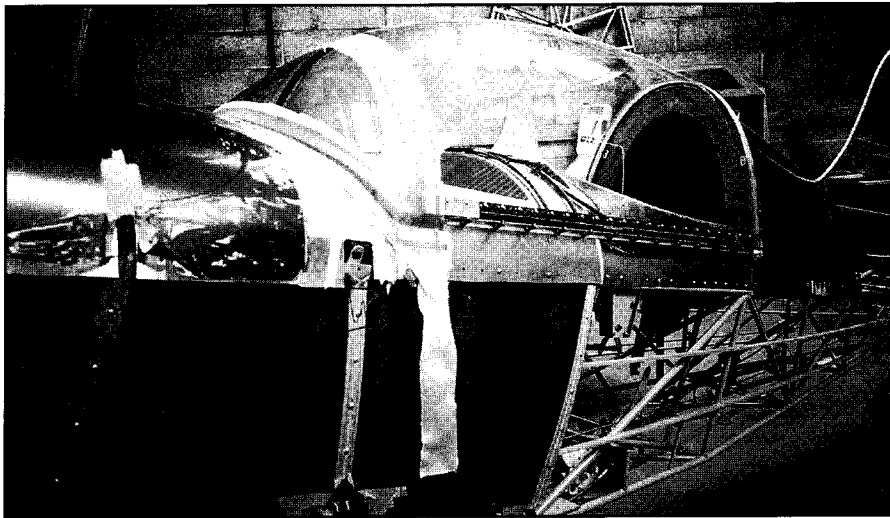
but after a while the plywood started to lose its shape between ribs. Fiberglass was going to be the only answer. A solid plug was made using 153 pieces of MDF board 3/4" thick profiled out with a router and bearing bit. These bonded together and finished made a great plug that was so heavy I needed help to move it. Standard fiberglass mold followed. It took 3 attempts to get the weight and strength correct, but when bonded on with structural cement they were astounding.

Fortunately I am a CAA (Civil Aviation Authority) approved welder so fuselage was straightforward. I have moved the undercarriage fittings on the lower longeron so they point out at about 45 degrees. The load coming up the leg meets the fuselage square on and takes the twist out of the fittings. Everything else on the fuselage steel work is standard. Instrument panels and turtle deck frames are all fiberglass, easier to make with much better corners. Much time was spent with the engine and dummy nose bowl fitted working out the profiles of the instrument panels, etc. I had seen a couple of Acro Sports where the top engine cowl dropped away from the firewall by about 3/8ths of an inch and I was hopeful of avoiding this as the straight line, in my opinion, looks much better. I have raised the turtle deck to 22" and made its profile more rounded to suit a full canopy, needed in these climates most months of the year. The bubble was originally for a Schleicher K13 sailplane and are quite cheap here, approx. \$600. The frame has given me some serious thinking time but achieved with a 6 1/4" slide back and hinge open. In a further attempt to save a bit more weight forward brake pedals and links have been omitted as well as rear seat pedal adjustment plates. I don't think the length of my legs are going to alter much and nobody else has much chance of getting into the back seat. All the rudder cables have been made as matched pairs, roll swaged ends without turnbuckles. Front pulleys changed for lighter alloy units with 3/32" balance cable and tensioner.

I have increased the size of the fuel tank to its absolute maximum, I haven't done a capacity check yet but will do so when I calibrate the contents gauge. I've used a Westach gauge and



David Almey's Acro II on the gear. Note fiberglass leading edges of wings.



Scheicher K13 sailplane bubble David adapted for his Acro II—works great!

capacitance sender. The sender is mounted in the front face of the tank near the centerline. The inner probe is protected in a vented alloy tube and positioned so the 15" flop tube can't touch it in any position. The tank outlet for the flop tube has been raised up on the tank a couple of inches, so that inverted flight with low fuel levels is possible.

Firewall is from polished .016 stainless steel. I used a large metal shrinker to get the curve in the alloy angle and was well pleased to get it from bottom corners right over the top in one piece. Access is available through the firewall to service or change the fuel tank sender unit.

Cable exit fairings also are fitted as mentioned in an earlier newsletter, I had just finished them as the newsletter arrived, but I doubt many will believe it.

One of the most frustrating things I realized on the aircraft was the lack of rear panel depth. I spent about 30 hours making a center console for

radio and transponder (a necessity if you want to fly to Europe in the next couple of years). After about 3 prototypes the final item arrived, still to be painted but neatly holding fuel gauges, circuit breakers, radio, VOR, ILS, intercom and transponder. It is mounted on 5 tabs welded to the front seat back secured internally with anchor nuts. The top is hinged for easier maintenance.

Engine is an IO-360-A4A, which has been zero timed driving a wooden Sensenich 76X56 prop. Original starter motor and generator have been discarded for lighter Sky-Tech and B&C units. The engine started life as an O-360 and has a standard sump. Bendix injection unit has been fitted to the original carburetor mount using a 90 degree bend supplied by Airflow Performance Inc.

Original Pitts-style nose bowl was found to be too heavy so after taking a mold another was produced in the same manner as the wing tips with epoxy resin and woven cloth. It

weighed in at 4 lbs. and about twice the strength of the polyester bowl.

As you can see from the photo it's on its wheels again having its final rig, to get things exactly right I had to put a spacer under the rear lower starboard interplane strut mount so I will have to remake that bit in the near future as I will not have any shims showing. I don't like to see the gaps between the interplane struts and the fabric so I have panelled in the ribs in these areas with 1.2mm plywood and glued a stiffener inside to maintain the shape.

Wing tips now being fitted with the ailerons lined up to get that exact trailing edge line. I have to take it to bits in the next two weeks and start fabric covering. The plane has been signed off already so progress might speed up a bit in the summer months. Fabric will be Diatex 1000HT, and Sky-Tech dopes and polyurethane paints. Color yellow with blue decor.

I would like to fit Don Baker's flying wire boots, they really do the job superbly. If you're reading, Don, thanks for the chat at Oshkosh '96 and fax me where I can get some from as they are not available in the UK.

Just to show I'm a glutton for punishment I have just purchased the wreckage of G-BLCF, an Acro II built by the late Mr. Owen of Swansea which was wrecked in 1990. I expect to rebuild this IO-320-powered Acro for sale. This should give me something to do after I've finished this simple little task!

Well that's about all for now, I should be in the workshop, not the office!

Happy Building (and Flying for the lucky ones)

Letters

To get an idea of what the Acro Sport Fly-In was all about, here is a report from Skip Egdorf:

I probably will screw up all the names...Apologies beforehand! I left New Mexico at 10:30 Friday morning. It is understandable why few planes went; at least from the west. Up until Thursday night, FSS wasn't just saying "VFR not recommended", they were "Kansas and Iowa solid IFR with ice". Friday morning at about 4:00 AM, Flight Service sounded a bit more hopeful. "It should be moving out a bit

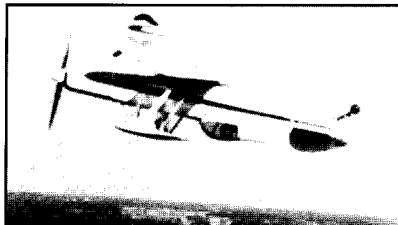
faster than anticipated, and if you wait 'til about 11:00 you should be able to get under low ceilings." They were right. Over the mountains at 12500 to Cimarron, down under the clouds, through Kansas and Iowa under 1500 foot ceilings with 10 miles visibility. Made it into OSH about 7:30 with about 7.6 hours logged.

It is really strange to fly into OSH without 10,000 planes and a million people!

Saturday, I drove over to Pioneer field at about 8:00 a.m. No planes were there yet, but Ben and Betty Owen had coffee going. I took the opportunity to go over the field like a tourist. The planes started arriving in mid-morning, and we ended up with three Acro II's

and a few other planes. (See list of attendees elsewhere in this issue.)

Despite being small, the fly-in was very valuable to one like me a-building. Lee Farnsworth, in particular, was a font of knowledge regarding small (and not so small) details of the construction. The discussions were wide-ranging. I got to discuss my one big planned change to the plans (a center section fuel tank). There was a discussion of bungees vs springs vs Wittman-spring landing gear. There was discussion of tricks for applying dope to various parts of the fabric. There was discussion of aileron-gap sizes and seals. There were discussions of a lot of other topics; too many to remember or give justice to. This was EXACTLY the



Fuel System Tid-Bits

by Don E. Baker

PART ONE

This time I would like to talk about fuel systems and what I have learned about them. So far, I have had only two major problems with the fuel system on my Acro Sport II, N122DB. The first one was a fuel leak from one of the foot-long hoses which interconnect between the aluminum fuel line (3/8" tubing) and the manual wobble pump. These hoses were fabricated from the Aeroquip 601 hose according to the specifications and procedures. The installed bend radius was within specification limits and the hose still failed. It turned out to be a "problem" that Aeroquip was having with the manufacturing of that type of hose. While it is a pretty hose, what with all that stainless steel braid showing and the red and blue anodized fittings, it is not necessarily the best hose to use. I talked to the Pitts factory (a suggestion from Ben Owen) earlier when I experienced a failed engine oil hose, and their experts confirmed that the 601 hose should not be used, "not enough rubber in there". Their recommendation was to remove all the 601 hose and replace it with 303 hose, which I promptly did throughout the engine

compartment. At that time, I assumed that the ones back in the cockpit by the manual fuel pump would be OK and did not change them. That turned out to be a mistake. I replaced them when they failed about two years after I had replaced all the engine hoses. In the subsequent ten years, I have not had any problems at all with the 303 hoses. Not only did Aeroquip acknowledge the problem, they reimbursed me for the cost of the new 303 hoses after I sent them the "bad" ones for their inspection.

The other problem was cracking of the fuel tank about halfway down the back side. This one-inch long crack developed after a couple years of flying. I removed the tank and had it repaired by a local welding shop. Then about a year later, another crack developed. I ended up talking to Curtis Pitts (another good suggestion by Ben Owen) and he enlightened me on the problem. Curtis insisted that it was due to vibration and the fact that my fuel tank had "flat" sides. He said it should have been constructed with reinforcement ridges rolled into the front and back side panels and that it should be

"bulged" so that the sides are not straight or flat. Since mine had neither ridges nor bulging, he suggested welding 5 or 6 "u" channels to the front and back sides and then carefully bulge the tank with air pressure, 1 or 2 psi, to give it resistance to vibration. I did all that and have not had any further problems.

I ran into a fellow at Oshkosh who was having trouble with the accuracy of his fuel gauge. He was using the sight gauge, as called out in the plans for the Acro. However, his readings were erratic and incorrect. A quick check of the fuel line revealed the problem. The line running from the top of the sight gauge to the top of the tank (vent) was not straight. It had been formed to run against the top longeron and then back up on both ends to reach the top of the tank and the top of the sight gauge. When bent in this manner, fuel will get trapped in the line and gross errors in fuel quantity indications will result. Don't do it. Keep it straight.

Always stick with proven fuel system designs. Trapping of fuel or air bubbles can cause serious fuel problems, possibly resulting in an off-airport or unplanned landing. If you install a header tank (I have not) then by all means do not invent your own plumbing arrangement. Go find a design which has been operational and proven with years of flight experience behind it. More complexity in any system creates more opportunities for failure. Keep it simple and do not use header tanks, etc. unless absolutely necessary.

More Next Issue

stuff I was looking forward to at the fly-in and it met all my expectations.

Ben arranged tours of the Kermit Weeks maintenance hangar and the new lodge (for housing Air Academy participants). There was time for a pass through the Air Adventure Museum across the field. The dinner was much like the normal convention dinners, with family style chicken and ham.

Sunday morning, there was again coffee and donuts. I took off early and headed west. Nice flight across Wisconsin and Iowa. Sure enough, right at Kansas there was the warm front. I ducked under a 1000' ceiling with 3 miles in rain section that lasted about 10 miles and exited into typical Kansas weather: 8-10 miles visibility, indeterminate ceiling about 6000', gusty, bouncy winds always pointed

right at your nose. The GPS that normally shows 130 knots started at 100 and went down to 80 as I bounced across Kansas. At the Colorado-New Mexico border, the visibility suddenly shot up to 80-100 miles. There were afternoon thunderstorms all along the mountains, so I spent the night in Pueblo, CO, then on to home Monday.

You can gather, Kansas just isn't my favorite state!

My main impression of the trip other than the fly-in was what an impressive job the national EAA is doing with both its budget and its volunteers. Ben Owen is a very nice guy who did a tremendous amount of work and showed a lot of what we don't normally get to see at the regular convention. It was impressive to get a bit of a behind-the-scenes look at what is going on. Everything from the new

lodge, to the Kermit Weeks Hangar to the organization of the volunteers at the museum speaks highly of how the organization is functioning and using both our donations and our dues. I am one of the mildly pro-local-chapter, anti-Big-Wig-National EAA types, but I was very favorably impressed with what I saw of the national organization. Thanks Ben, it was a good job!

Let's do it again soon.

Skip Egdorf
hwe@lanl.gov
N8849W - PA28-235
N????? - Acro Sport II under construction

This originally was emailed to David Hintenlang's Acro Sport web page, dhinten@nervm.nerdc.ufl.edu
Check it out if you're online.

Windshields...from page 6

want to practice on some scrap. When the plastic is hot enough to form, it has all the properties of a wet noodle. You have about 20 seconds to go from the oven to the form, so make sure your partner knows what you are expecting. When the plastic is ready, pull the sheet from the oven, and pick up the flannel sheet with the plastic on it by the four corners and lay it on your form, lining it up with some pre-determined marks. If you have it hot enough, it will lay very tightly to the form. If you have any dents or kinks in your form, they will be in your windshield.



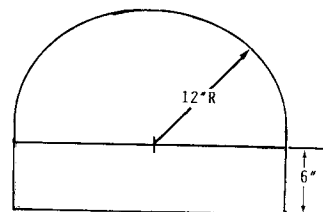
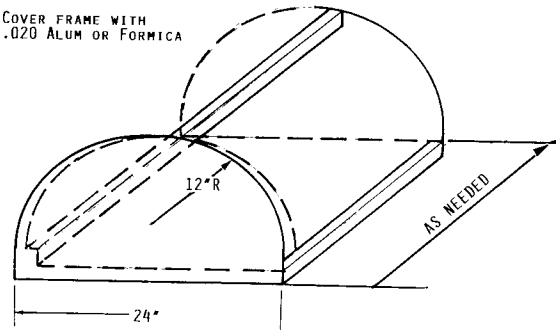
I wish I could take credit for figuring out how to make the flanges to attach the windshields to the fuselage, but I can't. Lou Stolp had some really good how-to articles in the Starduster news letters and this was one of them.

My flanges were made from 2024-O aluminum .060 thick. In the Stolp article he used .040 material and I think this would be better than the .060 I used. The .060 material simply caused more time to form.

The mounting holes were drilled in the windshields first, 1/2" from the edge on 2 inch centers. The flanges were formed to match the flat wrap of the windshields and the holes transferred through the plastic tape as a gasket between the acrylic sheet and the aluminum and bolted the flange to the windshield with 5-40 screws.

Now the high-tech metal forming takes place. I clamped a broom handle in my bench vise and used a wooden mallet to massage the aluminum into a slight curve as needed until it fit the fuselage. Once it fit pretty good, I used a short piece of broom handle to finish the radius with the windshields held in place on the fuselage then used a rubber and plastic faced hammer to set the flange tight against the fuselage skin. This may seem like an over simplification of the process, but that's the way it was done and I'm happy with the results.

COVER FRAME WITH
.020 ALUM OR FORMICA



Drawings by Bill Blake

FRONT WINDSHIELD

- A 12 1/2"
- B 41"
- C 23"R
- D 24"R
- E 22"R



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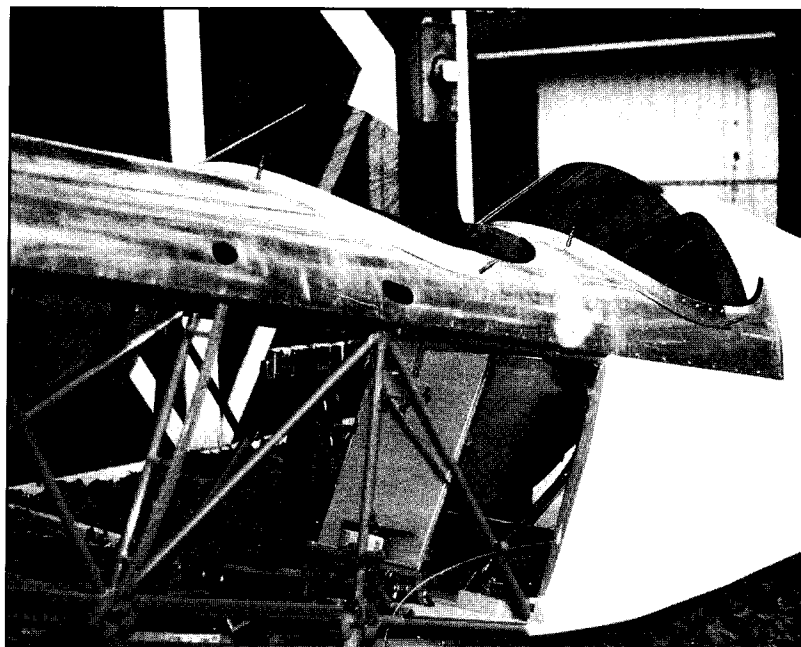
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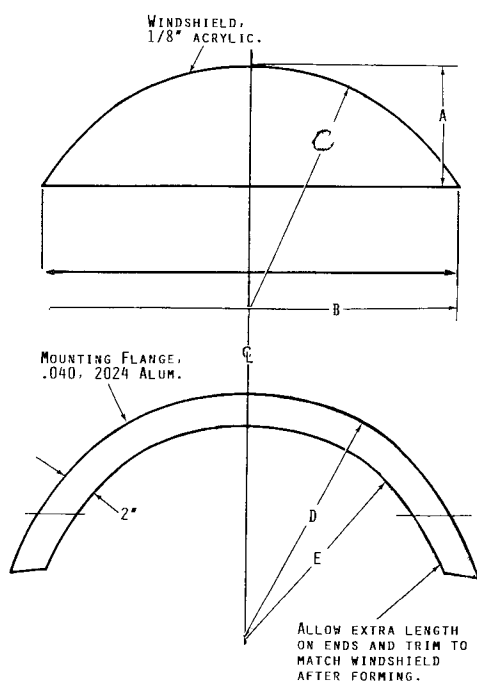




Opposite page left- Laura Sidders, age 7, gives her father Neil a helping hand.

Left above- Hot plastic sheet assumes shape of form and when cooled windshield is ready for trimming.

Right- Neat installation of front and rear cockpits on the Acro II. Clecos hold flanges in position for final assembly.



REAR WINDSHIELD

- A 13 $\frac{1}{4}$ "
- B 45"
- C 26"R
- D 27"R
- E 25"R



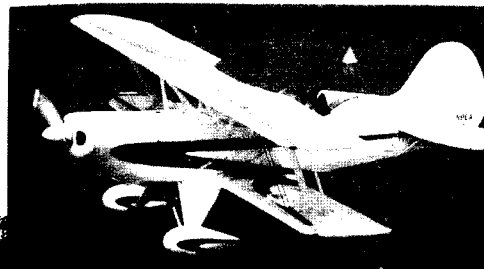
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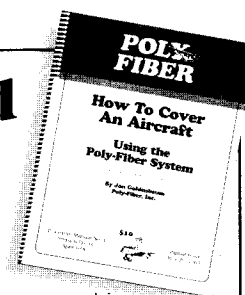


A BIG "Thank You" to Ben and Betty Owen for organizing the Acro Sport Fly-In held at Pioneer Airport June 6 and 7. "Organizing" in this case meant making sure every attendee was fed and watered, rides were arranged, repairs were made, and any special circumstances were taken care of, in addition to the months of planning necessary to pull it off. Hopefully this will become a regular event. Great job, Ben and Betty!

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