ACRO SPORT NEWS #13

& PROJECT SCHOOLFLIGHT OCTOBER, 1985

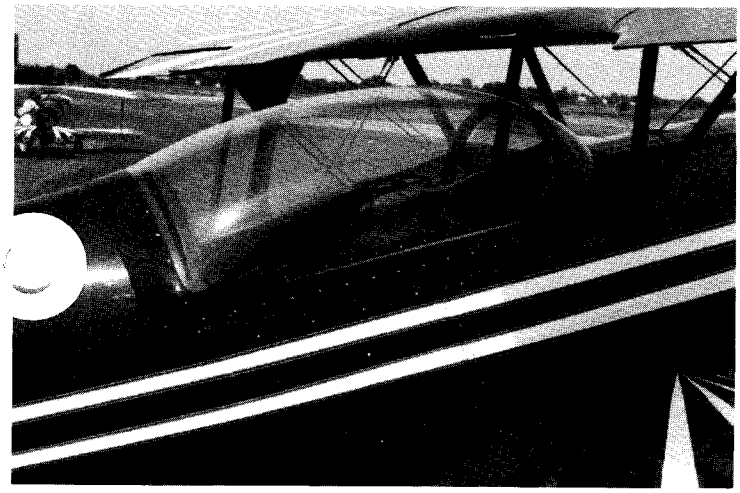
JACK ELENBAAS test flys his Acro Sport II. Jack has test flown his Acro Sport II the end of August, 1985. The aircraft has some modifications, as the photos below will indicate.

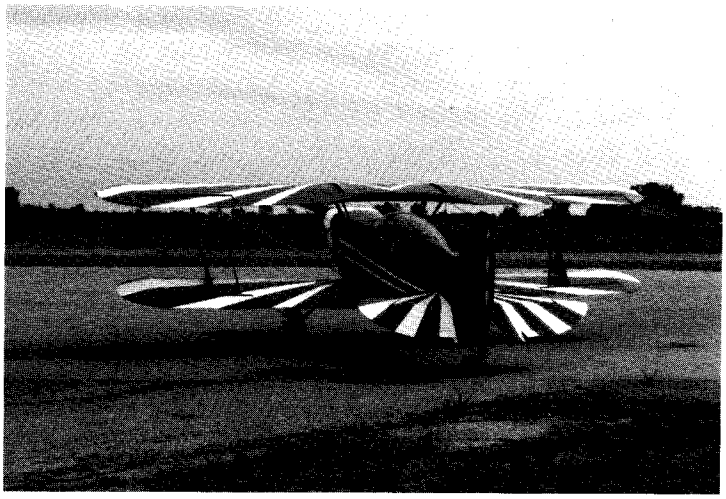
The canopy is a Pitts S-2 second purchased from the Aircraft Factory of Dayton, Ohio. It faired in very nicely with metal and fiberglass moldings (photo, upper left).

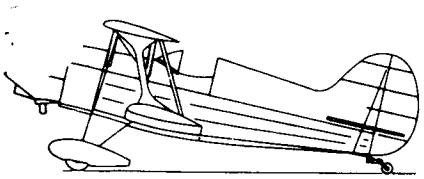
This side shot shows some of the unique features of this aircraft, which include spring steel landing gear (photo, upper right).

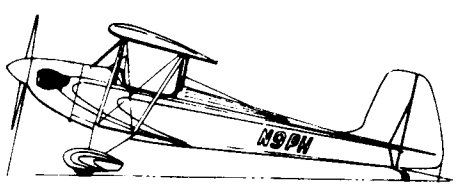
Jack took five years to build his airplane. He hadn't been flying for awhile, so he had a friend test fly it for him. This photo (lower left) shows Jack with his Acro II.

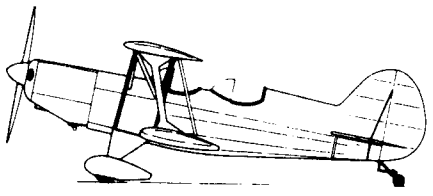
This particular shot (photo, lower right) shows off the modified wing tips described in the article on Page 2.











Jack was recently contacted and said the airplane does fly well and he is well-pleased with the spring steel gear. The airplane was test flown by a local friend who is also a highly experienced Pitts driver. He said that he made some very gentle landings on the first attempts, but Jack asked him to deliberately go out and drop it on to test the gear. This drop testing was successful and the aircraft didn't tend to bounce back into the air as some do with spring gear. He built his own gear from 7075-T65, cut it and tapered it from 4" wide and 1" thick at the fuselage to 1" thick and 2" wide at the axle. However, he quickly found that you don't bend aluminum in this condition. He had it annealed and press bent it as required to fit, then had it heat treated to T65 again.

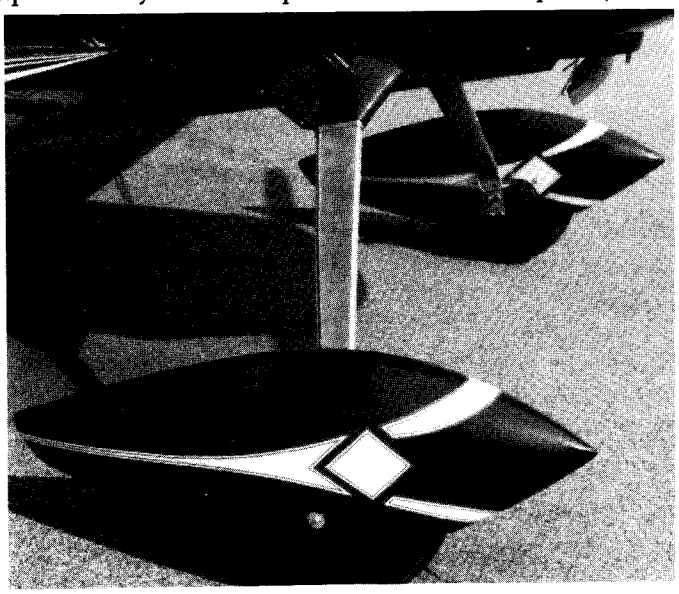
The canopy, as previously mentioned, has a fiberglass skirt comprised of fiberglass about 3" wide. He is especially proud of the excellent fit the canopy has to the fuselage frame, and he has every right to be proud of the canopy installation which he did.

The engine is a Continental IO-346A, 4 cylinders and 165 horsepower. He lives close to Muskegon, Michigan, where these engines were made and says that one of the former engineers for the factory claims that the engine developed about 180 horsepower when tested in the test cell. He has had no problems at all with this engine which came from a Musketeer prop and engine.

The prop is a 74-60 and the engine was originally built especially for Beechcraft. It cruises at 2,550 RPM at an airspeed indication of about 130-135 MPH. The airplane flew with no changes and he has not made any changes at all to the rigging since the initial test flight.

At this time, he has slightly over 8 hours on the airplane. Jack says that he is rusty as he hasn't flown in 4 to 5 years and the airplane does take some getting used to, but that his friend handles it quite well. The engine does have a stock Harrison oil cooler that came with the engine/prop combination when they took it off the Musketeer. It also has rounded wing tips and he made up a foam mold, laying Mylar over it and covered that with fiberglass and eventually with fabric. The entire airplane is done in Dacron cloth.

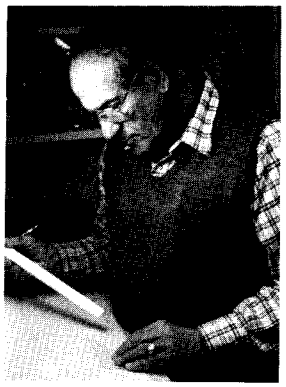
As far as the landing gear goes, the bottom longeron has been strengthened with a 4130N channel of .090" steel attached to the longeron about 10" to 11" long. He also has a diagonal tube coming down from the firewall to the landing gear area to brace this longeron. The empty weight of the airplane is 1,081 lbs. It has a full interior with upholstery and carpet in both cockpits, basic panel and a full electrical system. He says the engine weighs about 293 lbs. complete and he had no problems with weight and balance. The rate of climb is about 1,200 foot per minute dual and Jack says his personal weight of in excess of 260 lbs. has had no effect on the way the airplane flys with he and his test pilot aboard. He says this rate of climb can be maintained with full tanks and "quite a load".



The landing gear is obviously highly polished and the attaching of the Cessna-like wheel pants worked well. Not the deflection of the exhaust outlet underneath the cowling.

EDITORIAL

By Paul H. Poberezny

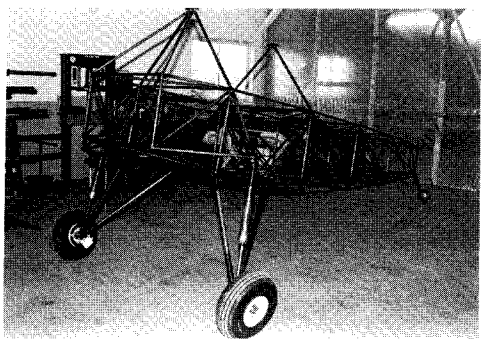


Interest in aircraft homebuilding is on the upswing. An increasing number of aviation enthusiasts are putting hand and mind to work building or designing a wide array of aircraft.

At this writing there are some 13,000 experimental aircraft on FAA's register and the number is growing each month and each year. We've also noticed that nostalgia plays a very important part in aviation. For a period of time, sleek, composite aircraft appealed to many. Now we see the interest returning in building steel tube, wood and fabric aircraft, aircraft with a special character...reproductions of earlier homebuilts, WWI aircraft, etc. Just recently, a gentleman from Fort Collins sent us pictures of his full scale Boeing P-12.

During the EAA Workshops at the Convention this year, I took out the drawings of a design that I have owned for a number of years...the Corben Junior Ace, which was designed in the 1930s. It was a two place, side by side airplane that could be powered by various engines and it was certificated by the Department of Commerce at that time. It could be built in either a cabin version or in a two place, side by side open cockpit version. My thoughts were this...after the design of the Pober Pixie, I received many letters from individuals who wanted a two place version of this machine...so back to the drawing board we went.

The Corben Junior Ace fuselage was widened to take care of two 200 lb. people, as the original fuselage was much too narrow for comfortable use. The original airplane was born and built in the Depression days when the "lean" times must have shown on the aviation enthusiasts of the day.



At this writing, we have two fuselages completed with one sitting up on its gear, wing ribs completed and one wing going together. We'll keep you posted as to our progress through EAA's SPORT AVIATION and LIGHT PLANE WORLD magazines as well as our Acro Sport newsletter.

We received a lot of letters from people who attended EAA Oshkosh this year and, in particular, from those who attended many of the workshops on covering, welding, wood work, composites, propeller carving, etc. Plans are already in the mill for the 1986 workshops and we hope that many of you have the opportunity to attend. Bob Stagner of Poplar Bluff, Missouri, will again head up the Pixie construction program.

The Nesmith Cougar drawings are now again available. As many of you will recall, Bob Nesmith of Houston, Texas, used the very popular Wittman Tailwind as a basis for the design. The aircraft are very similar in appearance as well as performance.

We would like to commend your Editor, Ben Owen, for his fine work in answering the many, many questions that are sent to him and for his fine work in putting together this newsletter. This newsletter is received by many dedicated individuals, EAA Tech Counselors (formerly Designees), fellow aviation enthusiasts and builders.

 EDITORIAL CONT'D. ...

We have received many letters from individuals relative to their concerns regarding product liability. EAA's SPORT AVIATION will feature a very fine article on the sale of one's homebuilt aircraft and liability one may incur. I think you'll find it both very interesting and extremely helpful.

Regarding the designs that I have prepared over the past years, with the legal environment that we live in today, I would have to state that all of the designs that I have put together are for educational and recreational purposes. If one desires to construct any one of these designs, they should have the understanding that there is no safety guarantee or warranty of any kind. When an individual builds an airplane, he must understand that one can be injured in so many ways. Aircraft, by their very definition must defy the laws of gravity and motion (temporarily). Any time this is done, there are certain inherent risks. In today's society you'll be finding more and more statements such as this, even with a great deal more detail, relative to not only aviation products but to other non-aviation products as well.

In talking with a number of attorneys on this subject, many of them feel that one should admit the product can be "unsafe" and forewarn the consumer. I am sure there are other attorneys who would not agree with this. However, you will find them, in representing their client, using the philosophy that their client should have been forewarned about the dangers of the particular product, be that product an aircraft or anything else. As of this writing, and to our knowledge, it has been a rare occurrence that a homebuilder has been sued relative to the building of his experimental aircraft ... however, our society is changing and we must protect ourselves.

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OSHKOSH ACRO SPORT DINNER

The following are the names of those who attended the Acro Sport dinner at Butch's Anchor Inn during Oshkosh '85:

Speakers Paul H. Poberezny and Bill Chomo (we certainly appreciate it), Jim Albers, John Baker, Norman Douthit, Richard L. Ekleberry, John D. Elenbaas, Maynard & Nancie Engel, Paul E. Felkner, Norman & Mary Gatzemeyer, Tony & Sandy Hohenwalde, Bill Hood, Jim Jahnke, La Fonda Jean Kinnaman (President of Acro Sport, Inc.), Charles & Gloria Knight, M. John Leitis, Ray & Patty Lentz, Ken & Carolyn Miller, Carl & Ann Rivait, Ted & Norman Skinner, Bob & Louise Stagner, Emilio, Becky & Monica Verastegui, Carl & Lisa Young. And a good time was had by all!

There were other members and their families who attended but did not sign up. The restaurant had a total count of 61. All in attendance wanted to have another dinner next year. We plan to see all of you there!

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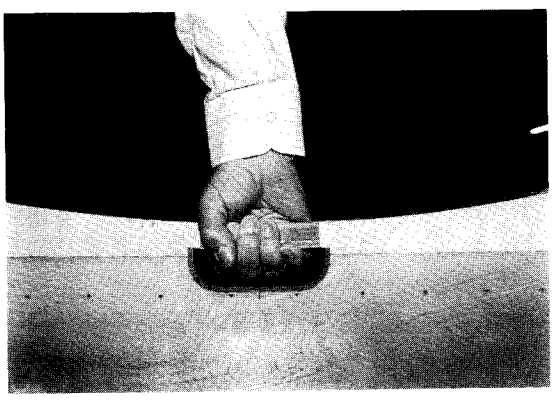
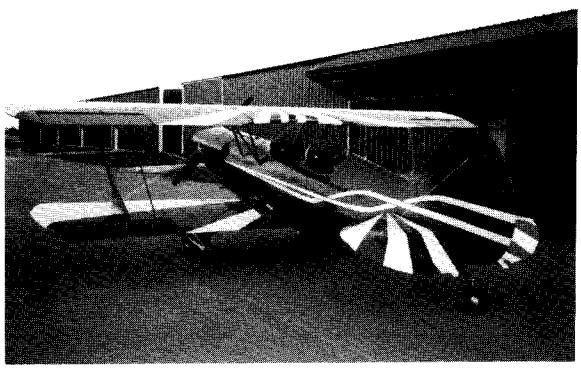
This Acro Sport II hand hold hole was made by laminating up light plywood and gluing it together.



LEE FARNSWORTH'S ACRO II



Lee Farnsworth's Acro Sport II was inspected by the FAA on September 20, 1985, and test flown on the September 24th.

The engine on this airplane is a Cessna H Model of 160 HP. Lee still hasn't figured out any way to put a 15 PSI pump on for the pressure carburetor he has, so he is still flying it with the 5 PSI fuel pump that came with the engine and using a float carb. If anybody knows of a way to modify this particular H engine to the 15 PSI pump, we would appreciate hearing about it. He does have a complete Christen inverted oil system and the airplane weighed at about 1,088 lbs. empty. The airplane has the combined nav lights and strobes on the wing tips. The power packs are also located in the wing tips to shorten the length of the high frequency leads required to the strobes. He has a slight shimmy in his Maule tail wheel and he is gradually solving this problem by moving the axis forward about 1/4" or 5 degrees at a time. He, like Jack Elenbaas, has a highly experienced pilot who is taxiing the airplane for him and giving him some instruction in taildraggers. He is using a Decathlon for this purpose.

Both cockpits have full VFR flight instruments and the rear cockpit has the engine instruments and a tachometer in the front cockpit. He plans to try out an injector carburetor at a later date. The propeller is a McCauley. The color is orange, buff trim and a brown stripe. The radio is a King with a full electric system and the battery a 12-volt wet cell aft of the rear seat. Weight and balance: left wheel 509, right wheel 518, tail wheel 72 for a weight of 1,099 minus 11 lbs. oil for 1,088 empty weight. CG empty 5" ahead of lower wing leading edge. Approximate gross weight: empty weight 1,088, oil 11 lbs., 22 lbs. gas at 132, pilot 180, passenger 180, for a total of 1,591.

Congratulations, Lee, on a successful test flight!

* * * * *

HINTS & TIPS FROM BUILDERS

QUESTION:

I am building an Acro II and I bought pre-welded components from Wag-Aero -- fuselage -- landing gear -- "N" struts -- tail feathers. I had the airplane all together, about ready to cover, but I have a problem with the airplane sitting level in both directions and proper dihedral and incidence. My landing and flying wires made hard contact when they cross. Is this normal, or should there be clearance between them? It seems to me they should not touch each other.

HINTS & TIPS FROM BUILDERS

ANSWER:

It is good to hear that your Acro II is about ready for cover. It is absolutely essential that you put the airplane all together before you start the fabric covering so you can find any potential problems before you cover them up. I would certainly check the incidence on the lower wing and make sure you have adjusted the incidence on the upper wing to be within 1/2 degree of the lower. The top wing is dead level with 0 degrees dihedral and the bottom wing dihedral as long as its fairly close won't make much difference. You will want to be sure the wings are rigged up and in place and the landing gear in place and that you are not setting one wing low. In particular, you want to check the alignment of the horizontal stabilizer and vertical fin with the wings to make sure they are square. The human eye is pretty good at this, but you might want to check with a level.

Regarding the intersection of the flying and landing wires, you can attempt to put one behind the other. If it is ahead of the other now it might make a little difference. However, you do want them to cross in the same general plane and to be kept apart by the flying wire separator. As long as the hard wood keeps the wires apart by 1/8" or so, this will be about all you'll need. You definitely don't want them rubbing together and you do not want the separator made of metal. Although you occasionally see metal separators on biplanes, they must have rubber or some other insulation device if they are made of metal. For this reason, as a suggestion, you might make them of hard wood and then you don't need any lining device for the gap holes.

QUESTION:

I'm having a problem placing the antennas on my Acro II.

ANSWER:

First of all, if you would go to the July '85 SPORT AVIATION and read the article by Moon Wheeler on antennas on page 40, I think you will have a pretty good idea of what would work with an Acro Sport II. Similarity of the Pitts Special to the Acro I, Acro II and Pixie will probably make that application very successful.

A locally recognized expert was contacted and his opinion was that hidden or concealed antennas for the aircraft would not perform satisfactorily. We would like to hear from any Acro I, II or Pixie builders with internal antennas that are working well. The expert's opinion was derived from the fact that ours are all steel tube fuselage airplanes. As I said, we certainly would be interested from any of you using internal antennas as to the success you've had. You might like to apply Moon Wheeler's advice to your antenna installation.

QUESTION:

Ben, I would like to see the specifications on the Pixie, Acro I and II.

ANSWER:

ITEM	PIXIE	ACRO I	ACRO II
Useful load	413 lbs.	354 lbs.	645 lbs.
HP	50-75	100-200	115-200
Span	30'	19'-7"	21'-8"
L	17'-3"	17'-6"	18'- 10-1/4"
H	6'-2"	6'	6'- 7-3/4"
S	134-1/2 sq. ft.	116 sq. ft.	155 sq. ft.

ITEM	PIXIE	ACRO I	ACRO II
Seats	1	1	2
GW	950 lbs.	1350 lbs.	1520 lbs.
NW	537 lbs.	733-926 lbs.	875 lbs.
Fuel	12.3 gals.	20 gals.	26 gals.
Baggage	20 lbs.	35 lbs.	30 lbs.
Vne Never Exceed	130 MPH	180 MPH	180 MPH
Vc Cruise Speed	85 HP (50 MPH)	130 MPH	130 MPH
Climb FPM	700	2400	1000
Vs Stall Speed	30 MPH	50 MPH	53 MPH
Takeoff - feet	300'	350' (200 HP)	350'
Landing - feet	300'	800'	800'
Ceiling - feet	12,500+	25,000	25,000
Range - miles	300	300	300
Airfoil	Clark Y	M-6 Reg; 23012 Spl	M-6
G yield	3.5+, 1.52-	6+, 3-	6+, 3-
G max	5.25+, -2.28	9+, 4.5-	9+, 4.5-
Acro OK'd	stalls, lazy 8's, chandelles, banks to 60·	all	all
Rudder deflections	32·R, -32·L	32·R, 32·L	32·L, 32·R
Aileron deflections	22·U, 22·D	25·U, 25·D	25·U, 25·D
Elevator deflections	30·U, 30·D	30·U, 30·D	30·U, 30·D
Power loadings - lb./HP	19	7.5	8.44
ihedral	2·Ø	0 upper +2· lower	0 upper +2· lower
Incidence	2.0·	1.5· upper & lower	1.5· upper & lower
W/S (wing loadings)	6.6 PSF	11.6 PSF	9.8 PSF
Colors	Bahama blue, Insignia white	Dakota black Lemon yellow	Imron white 5084 Brown 32954 Yellow 5819U Orange 5080UH
Aspect Ratio	6.7	6.6 each wing	6.1 each wing
Chord	54"	36"	42"

QUESTION:

I bought the Pitts factory pitot tube as the detail on Sheet 14, Zone 1-C on the Acro Sport II was beyond my capabilities. On receiving the Pitts tube, I was glad I had purchased it. Now, how do I get it put on? Does the block mount horizontal or vertical? Does it exit through the leading edge on the chord line or high through the nose radius? What size static line and pitot line is used and is plastic or aluminum used? I suppose it is run through the nose block void to the root?

Just a few comments I've noticed working the past year on two pages of wing plan and details. Then I'll leave you alone -- for awhile. The most disastrous mistake made (or almost made) comes from Sheet 13 lower wing plan detail D-4. This detail is referenced on both front and rear spars. Not so, ol' Ben. I don't want a 3/4" hole in the rear ›ar. I feel the rear spar note should detail D-5 or note "front spar only". I do, ›wever, have .090 2024-T3 aluminum plates on the rear because the 3/16 holes were already drilled. I'll admit that after closer study the rear face elevator shows no hole, but the detail took precedence.

Sheet 14. Bell crank assembly attach detail dimensions don't add up, at least they didn't for me. 5-5/8" center line is shown. I got 6-1/8" from spar elevator on Sheet 13 and idler assembly attach detail is similar, 5-1/8" shown, I got 5" to center line.

Let's go back to Sheet 13 lower wing again. Another problem was anti-drag wire at rib station #3 hit the vertical rib member or upright and had to be notched and doubled with 1/4 square stock. Should that #3 rib be a modified truss as shown on standard rib drawing by the facing page or back of 12?

ANSWER:

Congratulations on the progress you're making on your Acro Sport II. You are correct about the location of the pitot tube on the lower left side. It would stand to reason that the time you want it to be the most accurate would be on the usual left turn to final. Since the left wing at that point is going a tad slower than the right, that's probably why most aircraft have them on the left wing. However, I don't think it will make much of a difference as very few pilots fly on the gauges on turn to final anyway.

On the back of the ACRO SPORT NEWS Issue 9, October, 1984, there is a picture of the Acro Sport pitot tube. The pitot tube should be backed up with 1/8" plates similar to the aileron hinges. The plate need not extend more than 1" or so past the bolt holes. The reason is that the leading edge helps support the pitot tube so that the plates are really not critical at that point. The pitot tube should exit through the leading edge on the nose radius. You can use just about the smallest and lightest plastic tubing for pitot and static as they carry very minute amounts of pressure. It's not necessary to use aluminum. It does run through the nose block void to the wing root.

You are also correct regarding Sheet 13 in that some builders have made this mistake. One of our fellows in our shop is a woodworker who has few equals, and he made the mistake! What we did was just leave them like they are and run a hard wood dowel right through the hole. As it is plated front and rear, the spar is adequately strong at that point and won't need the addition of the aluminum plates there. However, if you hadn't done it yet, don't drill the horizontal 3/4" holes through the rear spars on the Acro II. Likewise, don't use the aluminum plates in that location as the doubler is strictly for the vertical bolt attaching the I strut at that point. Regarding Sheet 14, the dimensions there and the dimensions in Sheet 13 are slightly off. The reason is that the draftsman on Sheet 14 moved the arrow from the inboard side of rib #7 to the center line and it threw the dimensions off slightly.

As far as the bell crank assembly goes, you will want to position it so that in normal flight the push rod is in a direct line with the aileron hinge. If it is slightly off, if won't make much of a difference. I believe you can understand the reason for having the bell crank right on the hinge so the aileron won't bend under higher loads. The position of the idler assembly bracket is the same. The draftsman again made the same error in putting the dimension to the center line rather than to the inboard side of the plywood plate.

We were trying to make it easy for the builder, but it didn't work out that way. However, small dimensional differences will not make any significant differences in the airplane. You are probably aware that the center line of the bell crank assembly pivot is about 1/8" - 3/16" outboard of the outer bolt hole line on the bell crank assembly bracket.

Regarding the anti-drag wire at rib station #3 hitting the vertical rib member, you did exactly the right correction to the rib. I think your tolerance has just ganged up on you slightly, because I haven't seen this on the other four open wings I've seen and worked on.

QUESTION:
My drag/anti-drag wires don't fit in the center section unless the rear drag/anti-drag wire tab goes in the second hole on the rear spar.

ANSWER:
You are correct in that the drag/anti-drag wires go in the second hole on the rear spar. Unfortunately, this was incorrectly shown on Sheet 12 of the Acro Sport II drawings. In addition, front and rear spar fittings are normally flip-flopped so that on one side we would have the attach holes up-down, up-down, and the other side we would have the attach holes down-up, down-up. Unfortunately, this was not shown on the plans, but is a way to eliminate interference between the drag/anti-drag wires at the center rib.

Of course, the center section is additionally reinforced with 1/8" plywood. If it is used as a fuel tank, it is covered with 1/4" plywood on the bottom which will normally take the place of the drag/anti-drag wires as the tank fills that space. It is then usually covered with 1/8" plywood on the top. We have not yet devised a drawing for a center section tank, but I know that some of the aircraft are being built with the center section tank for long cross-country flying.

QUESTIONS & ANSWERS ON THE ACRO SPORT II:

A. Q: What is the angle of incidence to the horizontal stabilizer on N9EA?
   A: The angle of incidence of the horizontal stabilizer was set level with the top longeron of the fuselage and has not been changed since the test flight.

B. Q: What is angle is the elevator horn in relation to the elevator? Is that determined after control system assembly?
   A: The elevator horn is perpendicular to the push rod. We never determined what angle that was in relation to the elevator. If the horn is not exactly perpendicular to the push rod, you will have some slight differential elevator. This should be determined on the airplane by actuating the controls and not welding the horn in place until final assembly.

C. Q: Referring to Page 3, Zone B-5, I would like to know the length of the side stringer clips for Stations 2, 3, 4, 5, 6 and 7.
   A: Side stringer clips were made oversize, attached to the fuselage and faired in nicely with the side stringer in place and clamped, and then cut the clip to size.

D. Q: Page 10, Zone 1-D. It appears that the stabilizer leading edge butt welds to the spar. Is this intentional or can these be run through the spar and the spar rolled over them?
   A: Page 10, Zone 1-D stabilizer leading edge tube is welded to the spar. It is not necessary to run the tube through the spar and roll the spar over it. Actually, you wouldn't call that a butt weld, because a butt weld entails a 90· cross-section to the tube center line. At any rate, there is no problem with the strength at that point.

E. Q: Page 10, Zone 2-D. The servo trim tab system detail shows dimension 1-1/4" and on Page 11, Zone 1C, the servo trim tab detail shows 1-3/8" dimension. Which one is correct?
   A: Page 11, Zone 1C. Change 1-1/4" to 1-3/8" on Page 10, Zone 2D. This change is made to later plans.

F. Q: Page 11, Zone 2A. The trailing edge trim tab radius dimension is 3/16". Does this mean the trim tab tapers? It doesn't appear to on the drawings.
A: Page 11, Zone A2. The tab radius dimension is 3/16" which is an approximate radius. The trim tab top and bottom skins are not parallel. If you add up the total dimension 1/2 + .063 + (2 x .025) you will come up to be .613" in front.

G. Q: Page 3, Zone 1C, tail spring bracket. Shouldn't the flat bracket dimension be 2-1/4" instead of 2-3/4?
A: Page 3, Zone C1. The correction has been made to 2-1/4".

H. Q: Page 11, Zone 3A. Shouldn't the inner horn on the servo trim tabe system be facing down instead of up?
A: The inner horn of the servo trim tab should be facing down. This correction was made to later plans.

I. Q: Page 3, Zone 2C. The fin support detail shows 15-9/16" high. As drawn, this is a little confusing. The dimension is not the height of the fin support tube, but is the height of the fin leading edge tube at the rear bulkhead support. My dimension of the fin support to center of tube is 16-3/8".
A: The fin support detail is not drawn to scale, but it is correct as far as dimensions go. The outline reference on Sheet 3, Zone C3 is not exactly correct. Where the fin leading edge comes across the fin support, it should be almost horizontal at that point. The bulkhead is 14-3/4" and it is almost a straight run from the fin support to the turtledeck. My plans slow 11-13/16 + 3-3/4 = 15-9/16" for height of fin support, 14-3/4 + 3/8 = 15-1/8 for bulk head #2, from top longeron C.L.

J. Q: Page 11, Zone 5C. Shouldn't the bearing assembly attach bracket be 3/4" radius rather than 3/8" radius? Also, what is the total outside width dimension? No outside dimension was given on the plans.
J. A: The bearing attach bracket should be 3/8R" and the hole is 3/8D" and the total outside width is 1".

K. Q: Page 10, Zone 3B, hinge strap detail. Should the center to center dimension of 4-7/8" be 3-7/8" instead?
A: Center to center dimension of this strap, Page 10, Zone 3B, is approximately 3-7/8". You are correct, this correction was made on later plans.

QUESTION:
Can I use a six-cylinder Continental on the Acro Sport?

ANSWER:

The Acro Sport I and Acro Sport II series are designed to use four-cylinder engines. The weight difference and the length difference would make it difficult to do this installation, but not impossible. The Acro Sport I and Acro Sport II fuselages were built quite long to give the pilot or front cockpit occupant a measure of safety. Were you to stretch out the cowling even more, the nose would be pretty long indeed! Anyone modifying the Acro Sports in this manner would have to do the engineering on their own, and, of course, also be responsible for that.

QUESTION:
My question regards drilling the fitting holes in the spars. Can I layout the spar, draw the lines and use your fittings for a template and be accurate? I would leave the ailerons and bell cranks until final fitting. Or, do you fit the butt fittings to the spar with a clamp, and then jig to the fuselage? I also need to know the correct way to drill the I strut holes in the spars.

ANSWER:
Regarding the spar, the plates are glued to the spars after the ribs are slid into the spaces and glued. It is best at this point to have a floor mounted drill press as

you can put the entire wing in the drill press and drill through the plates and spars for the fittings locations, but please pre-drill the plates first! You can also do it by the method you described, laying out the spars, drawing the lines and using the fittings for templates. You might try clamping the fittings to the spar and jigging to the fuselage using an incidence meter of the kind used by carpenters on a jig you set up on a wing to insure that it is at the correct angle incidence. See Acro Sport News #6 for Paul's way of wing/fuselage alignment.

There is one important feature that I am not sure that you are aware of. The rib drawings do either shrink or stretch with humidity in the air. Due to this, it is best to build the wings completely first, and then measure the distances between the spars before attaching the spar fittings to the fuselage. Most of the drawing sets seem to stretch with humidity.

QUESTION:

I used an 0-235 engine and Wag-Aero's bowl and there was conflict with the spinner. I then bought a Pitts bowl and had the same problem. The buyer had advised me that he had the same problem with his spinner.

ANSWER:

This appears to be a unique problem to installation of the 0235 engines in our aircraft. So far I haven't heard of any other problems with spinner and nose bowl conflicts on other engines used.

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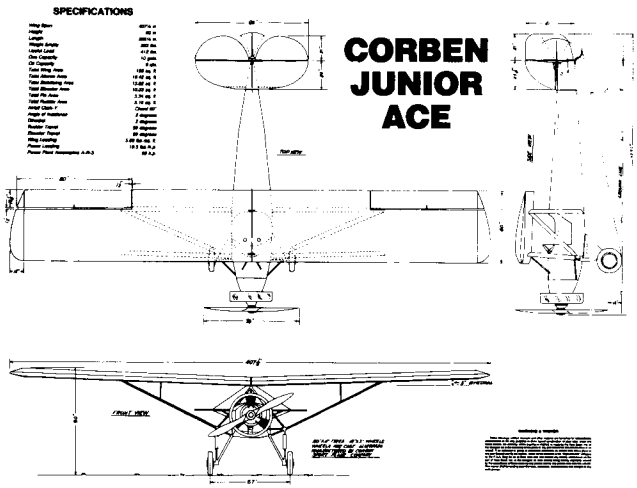

The Corben Junior Ace is a different airplane than the Corben Model D. The Model D is also a two-place side-by-side but about 7' less in span and a smaller airplane.

The Corben Junior Ace is a large size airplane with a total wing area of 168 sq. ft. With its wing area and the Clark Y airfoil, it is able to stall very slowly. Performance will vary depending on the engines installed.

The drawings of the Corben Junior Ace include 31 sheets -- quite a bargain for only $60.00! -- available from Acro Sport, Inc., P.O. Box 462, Hales Corners, WI 53130. The aviation historian, the aircraft designer, and, of course, the aircraft homebuilder will find these plans an invaluable reference for construction or research. Ace Corben poured his considerable knowledge of airplanes and structures into these drawings. They are a remarkable reference source for anyone interested in steel tube, wood wing airplanes. Among the drawings are detailed drawings of the wheels, detailed drawings of skis for wintertime use and much excellent information regarding design of steel tube structures including loads, factors of safety, point loads and additional design information.

These plans are an incredible bargain. I am sure anyone purchasing them will agree!

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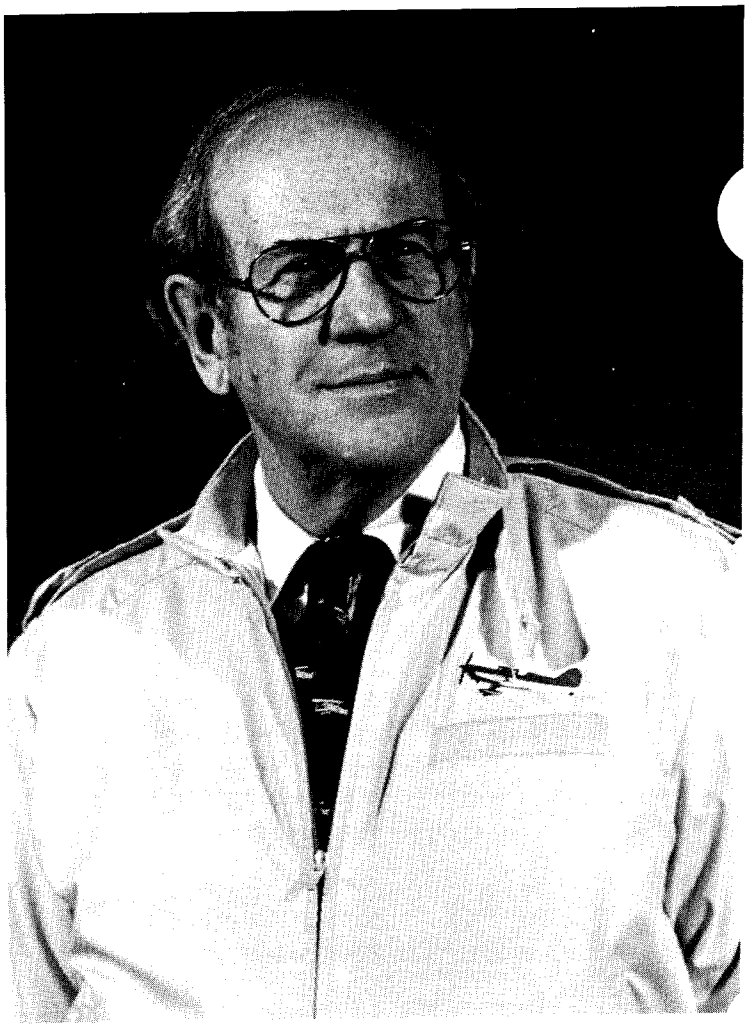

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