

56 in. span Sport/Scale contest winning design from the U.S.A.



CITABRIA

Ten years ago when I received my November 1968 issue of *Air Progress* in the mail, I went through my usual routine of flipping through the pages to see if there was anything of an outstanding nature to be found. When I came to the centre of the publication the centre-spread immediately caught my eye. It was one of the most beautiful aircraft that I had ever seen. A two page colour shot of a high parasol winged sports plane in a gorgeous colour scheme. That subject went right to the top of my 'models to build' list.

The aircraft, built by the *Champion Aircraft Company*, was designated Model 8KCAB. It was intended for production as a competition aerobatic special for advanced sportsmen. The aircraft had been hand-built using the basic bottom truss structure and tail assembly of the production *Akro Citabria*. The wing was an entirely new structure using the NACA 1412 airfoil. The nose was of fibreglass and power was the *Lycoming 10-360 Special* boosted to 200 hp output. The aircraft has a 'G' limit of 6-positive and 5-negative.

Champion sold out to *Bellanca* shortly after building the *Pro* and a decision was made not to produce the aircraft. *Bellanca* donated the original to the EAA.

Not knowing the above details at the time, I searched in vain for additional information on the *Pro*. Finally, I wrote to *Champion Aircraft* and got no answer. Several months later, I did get a reply from *Bellanca* informing me of the situation. There had been a fire in the *Champion* plant and the material on the *Pro* had been destroyed so they could not help me.

This did not discourage me, however, and I decided to modify a *Sig Citabria* kit into a *Pro*. I bought the kit but never got to it. I had been flying a model of the *Citabria* for several years. I had designed it from factory three-views sent to me by *Champion* when the *Citabria* first appeared. The model was a real fun airplane and quite attractive. It started out as an escape-

ment single channel ship with a Fox .15 for power ... that tells you how long ago it was built. Then I flew it with three different radios on three channels. It was a real fun airplane and very easy to fly. I let anyone fly it. My three children all flew it and nearly every flier in South Jersey has had a go with it. After eight or nine years, it was getting pretty beat up around the nose area and had been repaired several times. Finally, I had an elevator servo hang up and did it in, knocking the nose off for the third or fourth time. I decided it was time to build a new fuselage, but would make it into a *Pro*.

I scaled the fuselage up to fit my 56in. wing and got it built. When it was ready, it was too beautiful to put that old wing on it, so I built a new wing with the proper cutouts and with ailerons. My original *Citabria* had no ailerons. I had planned to use my three channel *Kraft* in the model and decided to try coupled rudder and ailerons. I had an old *Enya .29* sitting idle so I set the front end up for it. As soon as the model was finished, I took it out to the flying field and took it aloft. It was great. The prettiest thing you had ever seen in the sky. Low fly-bys were fantastic as you can slow it down to next to nothing. It does nice loops and snap rolls and spins like crazy. I doubt if there is an easier-to-fly scale model in existence. Unlike most scale models, this one would make a good trainer. Shortly after the test flights, I took it to Toledo and entered it in the non-Military Sport Scale Event and came home with the fifth place award and the model wasn't finished yet. I flew it in its first contest and it was judged second to Bob Karlsson's *Ryan PT-22* by only a couple of points.

By the second contest, I had finally finished the detailing on it and it has come out on top in static judging in every contest since that first one. I have also flown it in five AMA events and it has won two firsts, one second, one fourth and one fifth. It has failed to win a trophy in only one contest in two seasons of

flying, and that was because it was so windy that with only the .29 powering it, I ran out of fuel before the flight was completed on both my flights and received a zero for my landing as I didn't make it back to the landing area. I ended up in sixth place only eight points behind first. Not bad for a fun ship, winning 11 trophies in 12 contests over a two year span.

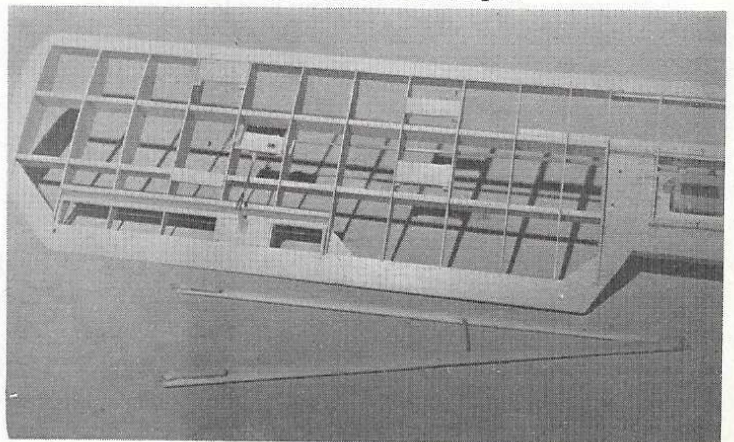
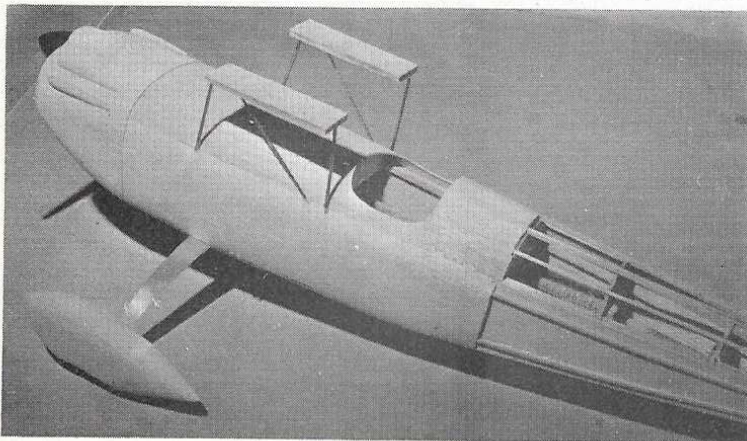
Now that you have the model's background and competitive record, let's get to the building.

The model is quite simple to build so here again we do not have to restrict it to only the experienced modellers.

Fuselage

The basic sides are cut from 1/8 balsa. 1/4 square is glued to the inside, top and bottom of each side. Make sure you make one right and one left side. Now form the cabane strut wires and epoxy them in position on the outside of each side sheet. Cut out a pair of 1/4 fuselage doublers which extend from the firewall to the location of T-6. Align the doubler over the side and press into position to mark the underside where the cabane wires are positioned. Now turn them over and with your model knife cut out a slot for the wires to fit into. The doublers can be added to the sides when this is done. When dry, the sides may be fitted to the firewall which has been cut from 1/4 ply. All top and bottom formers are cut from 1/8 balsa and a 1/4 square cross member is cut for each former. The length of these cross members is 3/4in. shorter than the former. Install the cross members and formers back to T-4 and B-5. Let this dry and then pull tail together and glue. Now the remaining cross members and formers

Below left: front of fuselage, model is ready for covering, push-rods are installed. Note that the 1/4 in. fuselage doubler covers the lower part of the cabane struts. Below: wing and wing struts, note that pushrod wire from servo is supported in a nylon outer for most of its length.





PRO

By
HENRY A. HAFFKE

can be added. The top of the fuselage is sheathed with 1/16th balsa back to T-6 and the bottom back to B-3. Make a 1/8 ply landing gear mount to fit between the sides and B-3 and B-4. The landing gear wire is bent and installed on this mount.

Finally, the stringers are added and the 3/32 sheeting under the stab location. The 1/8 ply wing mounts are cut and glued together and may be epoxied to the cabane wires. They can be held flat across the top while drying with a straight edge.

Wing

The wing is very easy to build. After cutting out all ribs, mark rib location on front and rear spars. Ribs are slid onto the spars and glued. Leading edge and trailing edge are added. When all is dry, the dihedral braces can be installed in one panel and when dry, the two panels may be joined by sliding the dihedral braces into position on the remaining panel.

This will give the wing just a slight amount of dihedral. The $\frac{3}{4} \times \frac{1}{4}$ pieces are added to the rear of the wing centre section and the filler blocks also added. Blocks can be cut of $\frac{3}{8}$ beech to fit flush with the cutouts in the bottom of the dihedral braces. These are epoxied in place and the spars can be relieved between the cutouts. Wing can be located on cabane wing mounts and hole drilled for nylon bolt. Thread the hole in the basswood blocks and enlarge hole in mount to take bolt. Wing is finished by adding gussets where shown and the $\frac{1}{8}$ ply strut mount and bellcrank mount pieces. Tip blocks are carved and added and the ailerons are built.

Wing struts

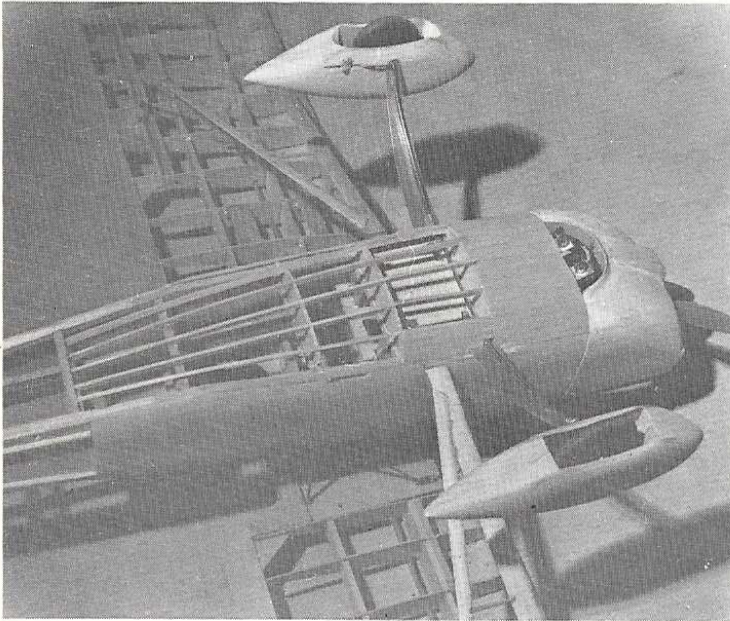
Two sets of wing struts are made using spruce as shown on drawings. 1/16 wire strut ends are formed and epoxied to strut ends. A hinge with removable pin is epoxied into the lower end of the struts and the other half of the hinge is

**For .29 cu. in.
to .40 cu. in.
motors and
four function
control
systems**

epoxied into the fuselage where the strut meets. 3/16 dowel is cut to fit from struts to wing where shown. These dowel pieces are epoxied to the struts and a short length of 1/16 wire is epoxied into the upper end which plugs into the strut mount ply piece in the wing structure. Finished struts are installed by plugging the wire strut ends into the outer strut mounts in the wing and then rotating the strut down into position which will enable the dowel ends to plug their mounts. When wing is installed, the two hinge halves will come together and are held together with a common pin which is bent after installing.

Tail surfaces

The tail surfaces are cut from 3/16 sheet and are sanded to shape. A length of 3/16 dowel is epoxied between the two elevator halves as a joiner. When sanded to shape, the parts may be hinged and installed.



Engine cowl

The cowl is easily formed of 1/2 in. soft balsa sheet. Cut a cowl front and referring to the markings on the cowl front and the fuselage side view, cut 1/2 in. sides, top and bottom pieces. Glue these together and when dry, the cowl may be carved and sanded to final shape. It will be necessary to use triangular stock in the corners as seen on the cowl front. The top block will have to be hollowed to clear the motor.

Wheel fairings

Wheel fairings are built up by laminating the 1/2 in. cores and 3/16 side pieces. NOTE that the inside of each fairing has a ply insert built in. Solder a 2 in. length of 1/16 wire to the main landing gear wire so that it extends straight back from the axle. Use a regular landing gear strap held with two short screws to hold this wire to the ply insert. The fairing will be held secure and is easily removed and will flex if caught.

Finishing

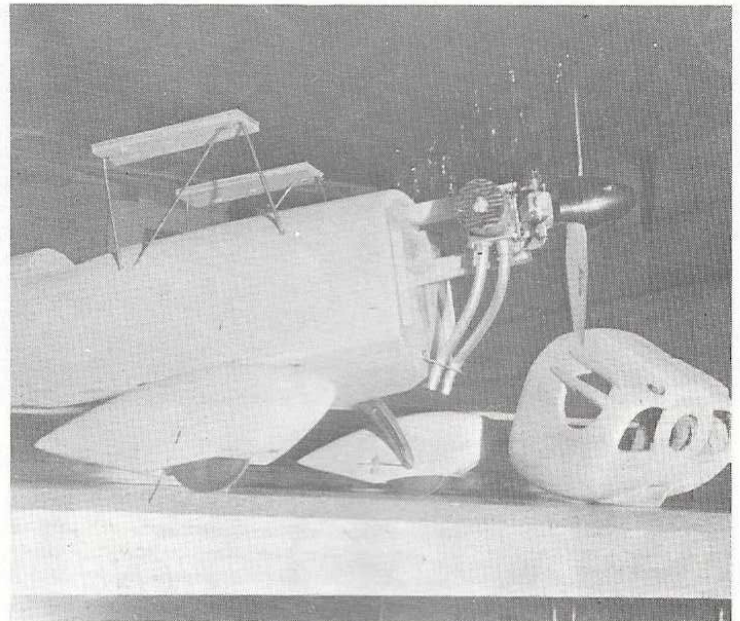
Everyone has their favourite finishing method and feel free to use yours if you have one. My finish may prove interesting to many of you as I tried something I have had in mind for quite some time with even better than hoped for results. I have used heat shrink film on several of my sport models and have wanted to try using it over tissue. I decided to make the Pro the test bed for this equipment. First, I gave the entire structure two coats of dope sanding between each. Then, I completely covered the model with heavy weight tissue. I applied this in the usual manner, wetting it and doping it to the

structure. Next, I film covered the fuselage and tail surfaces with red colour. The licence numbers and striping were cut from white material and applied this over the red. The white trim on the fin and rudder were also applied with heatshrink film. Then, I covered the bottom of the wing with red and next laid out the sunburst design on the top of the wing. I cut the white sections about 1/4 in. oversize and applied these to the tissue covered wing. Then, I cut the red sections and overlapped the white about 1/8 in. all around. This gave me a beautiful covering without the usual problems involved when putting one colour over another with heatshrink film and would not have been possible without the tissue covering underneath. Try it, you will like it. The cowl and wheel fairings were finished with colour dope.

The model is over two years old now and has been flown a lot, not just in contests.

With the silkspan under the plastic film, it

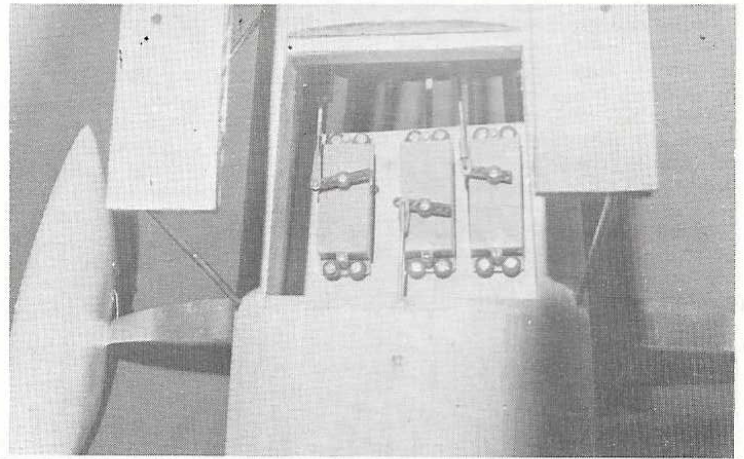
Right: plenty of room for the radio gear, access is via a neat hatch below seat. Centre servo is used for motor control. Power pack and Rx are positioned in front of servos. Gear should be positioned as far forward as possible to get the balance point in the right position.



Above left: underside view reveals obvious position for the exhaust outlet which can be ducted from the silencer with silicone tubing. Note the short pieces of wire retaining the wheelspats. Above right: silencers are not mandatory in the U.S.A. but no doubt the cowl and small bore outlet pipes reduced the noise on Henry Haffke's prototype to acceptable levels.

rarely develops a wrinkle. I have since used this finish on two other models with equally satisfying results.

When your model is finished, balance where shown on the plan and fly it. Don't let it just sit around and collect the dust because it is 'too pretty to fly.' Flying is what it does best. My model weighs about 5 1/4 lb. and flies great on the .29 except on a real hot, muggy day. If you want a real performer, use a .40 with four channels and have a ball.



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