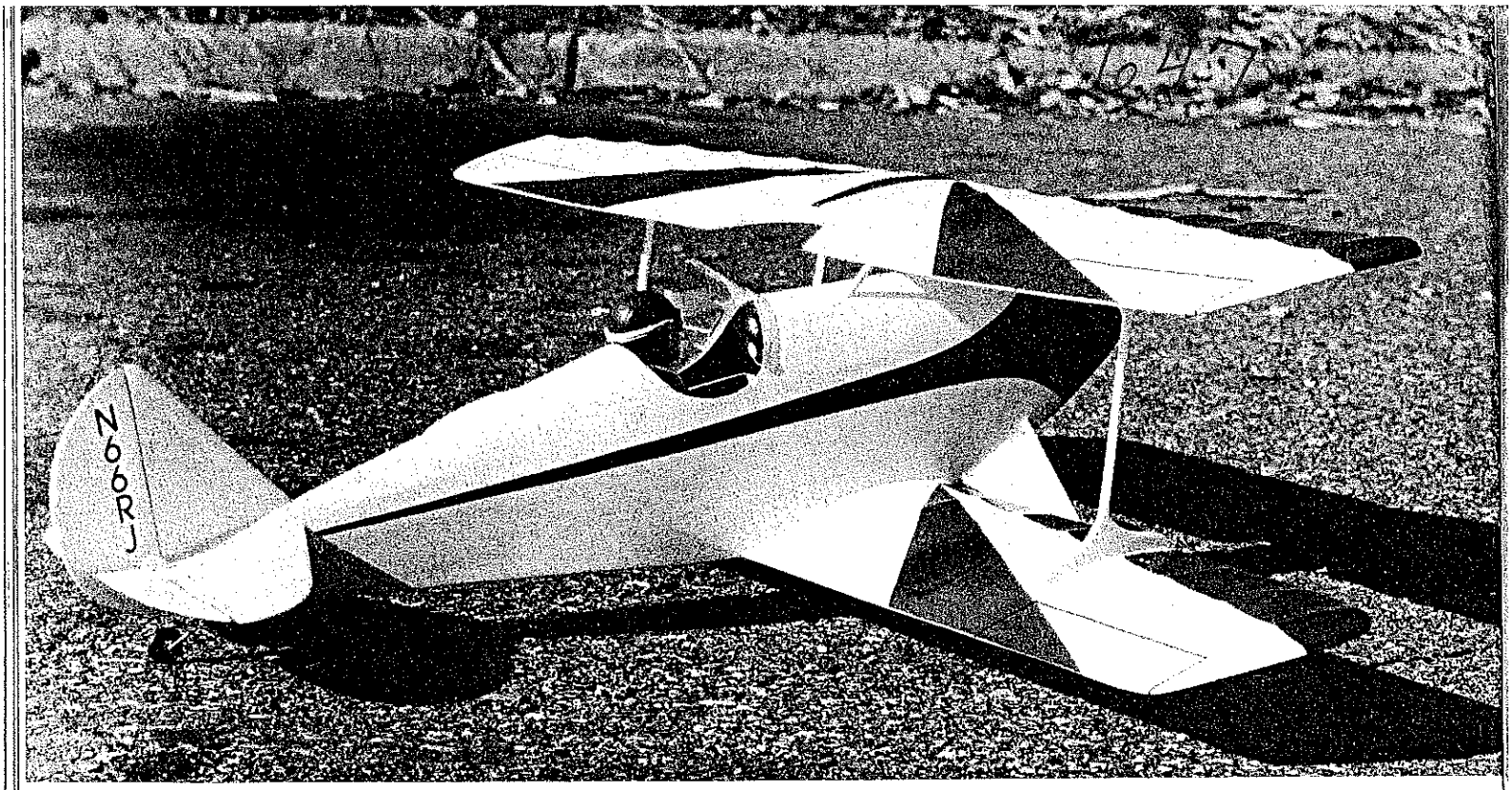


The finished model ready for flight. The color scheme and all the little details, such as aileron outlines, pilot (1½-in. Williams Brothers), instrument panel, and registration numbers combine to create the illusion of a full-scale aerobatic biplane rather than just a ½A CL model.

Cox Special

The lines of both the Pitts Special and the EAA Biplane can be seen in this classy semiscale ½A Control Line biplane. Construction is straightforward and uncomplicated, yet the model is quite an eye-catcher at the flying circle. ■David Fortuna

BIPLANES have always held a special attraction for me as a modeler. There's something about an airplane with two wings that fastens your attention. Biplanes came along during the period when barnstormers and air shows flourished. Aviation was still glamorous and exciting in those days, and biplanes contributed much to its development. Though I've built quite a few of these two-wingers over the years, I never tire of their classical appearance.

Since I'm a longtime pilot and aviation enthusiast, I wanted the Cox Special to resemble a full-size airplane as closely as possible. This meant using a built-up fuselage and wings, and making the engine as fully enclosed as possible. Even so the model is relatively easy to build. At the same time, keeping the airplane small and using a ½A size engine drives down the cost of building and flying it.

This model's resemblance to the Pitts Special and the EAA Biplane shouldn't be surprising. Most of the inspiration came from these two airplanes. The model's name is a spin-off from the Pitts Special, still considered one of the finest aerobatic airplanes in the world. A friend, Mr. C. B. Messer, owns and flies a Pitts, and the two of us have logged a few hours in the EAA Biplane as well.

Construction. If you're new to building from plans, look them over carefully and review the text before you begin construction. Since this model follows basic construction procedures, everything should be fairly straightforward if you've built a few models from plans already.

I used standard off-the-shelf balsa—around 6- to 8-lb. stock. Be a little more selective if you're looking for maximum performance. Since it's a small model, 4- to 6-lb. stock can be used for most parts. The main thing to remember is to stay away from wood that's brittle and hard, or the kind that's soft and mushy.

Except where epoxy is called for in the text, aliphatic resin is the adhesive used throughout the model. The yellow aliphatic glues, also known as carpenter's glue, sand much better than white glues. Try not to overdo the epoxy where used; this glue is as heavy as it is strong.

This principle applies to all the glue joints in the structure. Tight-fitting joints and a thin coat of glue on the mating surfaces produce a strong and lightweight model. Large blobs of glue add excessive weight and detract from the final appearance of the airplane.

Make sure that your building board, whatever its material, is warp free and firm enough to hold pins securely in place. Your local building supply store should have suitable material.

Tail surfaces. Since these parts take less time to build, I usually make them first. Cut the stabilizer, elevator, fin, and rudder from 3/32 sheet balsa. If you decide to use nylon hinges, carefully cut out the hinge slots. I used small Du-Bro hinges on the prototype. The outboard hinges that fit in the elevator will need to be cut a little short. Cloth hinges can be used instead; they're somewhat easier to install but don't look as nice. If you use them, be sure to install the elevator horn beforehand. The elevators are joined together with a ⅛-in. dowel.

Wings. Don't be turned off by the idea of building two wings. Two don't take much more time to build than one, and they're twice as much fun. Personally I like building wings—the more the better.

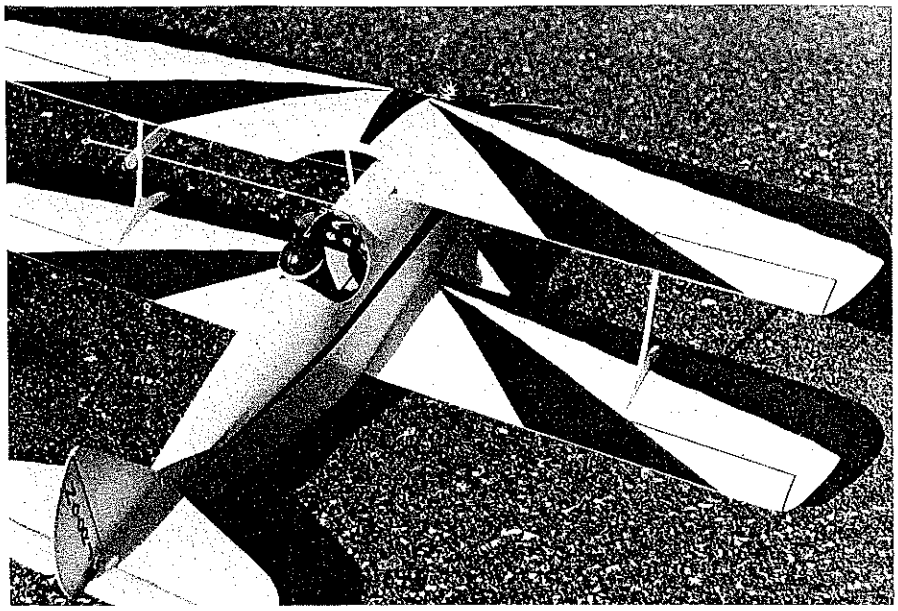
Both wings are built in one piece, with no dihedral. Building the bottom wing first, begin by shaping the ⅛ x ½-in. trailing edge stock with a sanding block. Alternatively, you may use formed trailing edge material. Pin down the leading edge, spar, and trailing edge, and glue the ribs in place. When gluing the double strut ribs, insert a scrap of ⅛-in. balsa between them to act as a temporary spacer. The three center ribs are undercut 1/16 in. on top to allow for the center section sheeting.

Glue the ⅛-in. balsa wing tips in place, being sure to raise them ⅛ in. as shown. Glue ¼-in. triangular stock in place against the tip ribs and the leading edge.

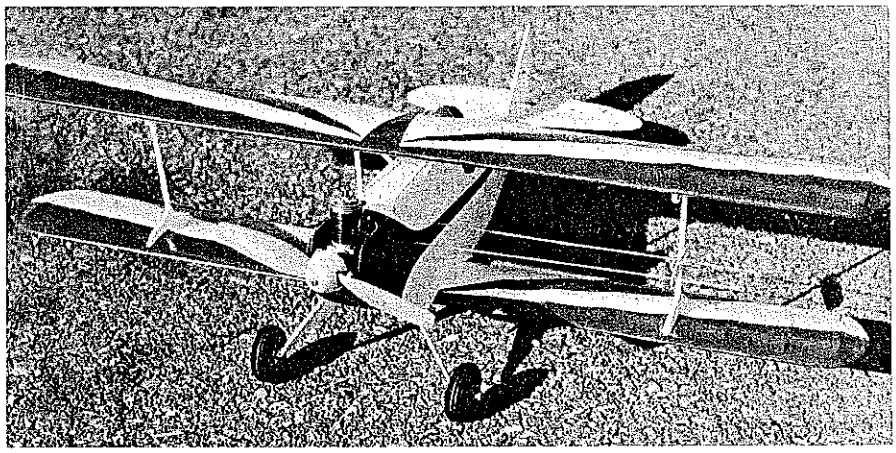
Once the glue is completely dry, remove the wing from the building board. Add the 1/16 balsa center section sheeting to the top only. Glue a 1/16 balsa strip between the double strut ribs, making sure it's flush with the bottom. Sand the leading edge and wing tips to shape. Glue ¼ oz. of lead in place on the right bottom wing before covering.

Build the top wing. Pin down the leading edge, spar, and trailing edge as you did with the bottom wing. Glue the ¼ x 5/16 balsa center section to the trailing edge. Add the ribs and wing tips, trimming the three center ribs at the rear for proper fit. Add the ⅛-in. balsa piece into which the center section struts will be fitted.

The wing strut is a ⅛-in. dowel which is glued into a slot in the wing strut fairings. A 1/16 plywood lead-out guide is epoxied on the left wing strut. The completed wing struts will be glued in place after the wing has been covered.



This top view shows the trim pattern on the wings and some of the cockpit details. Covering is lightweight silkspan, but any good quality tissue will work well. Iron-on coverings tend to warp lightweight structures. A good finish and color scheme really shows off the model.



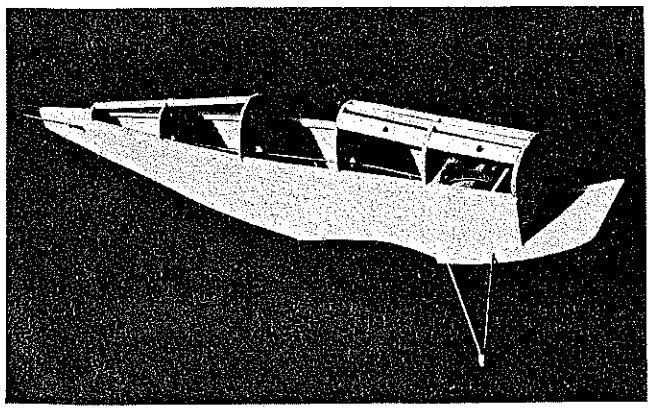
This photo shows the Cox Baby Bee engine installation. A Cox 5½-in. prop is used with an Ace 1-in. spinner to dress things up. The lead-out lines are made up from .025 music wire.

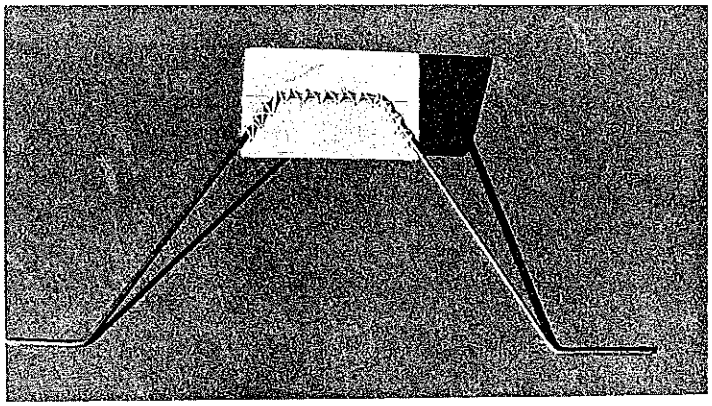
Fuselage. Cut the sides from 1/16 balsa, and mark the location of the formers. Glue 1/16 balsa doublers along the bottom between formers F2 and F5. Don't forget to make a left and a right side. Cut out two holes on the left side for the lead-outs. Cut out a slot for the pushrod exit on the right side.

Glue ⅛-in.-sq. balsa along the top of the fuselage sides, letting it overhang 1/16 in. as shown. Glue F4 in place, allow to dry, then glue in F5, F6, and F7. Glue the tail together.

Bend the landing gear wires from .062 music wire, making the main gear which fits on F2 first. Draw the gear outline on F2, and drill holes for the landing gear lacing every 3/16 in. or so with a No. 59 drill bit. Sew the gear in place with ½A Dacron flying line or carpet thread. Apply epoxy to the gear wire and thread, and glue F2 in place.

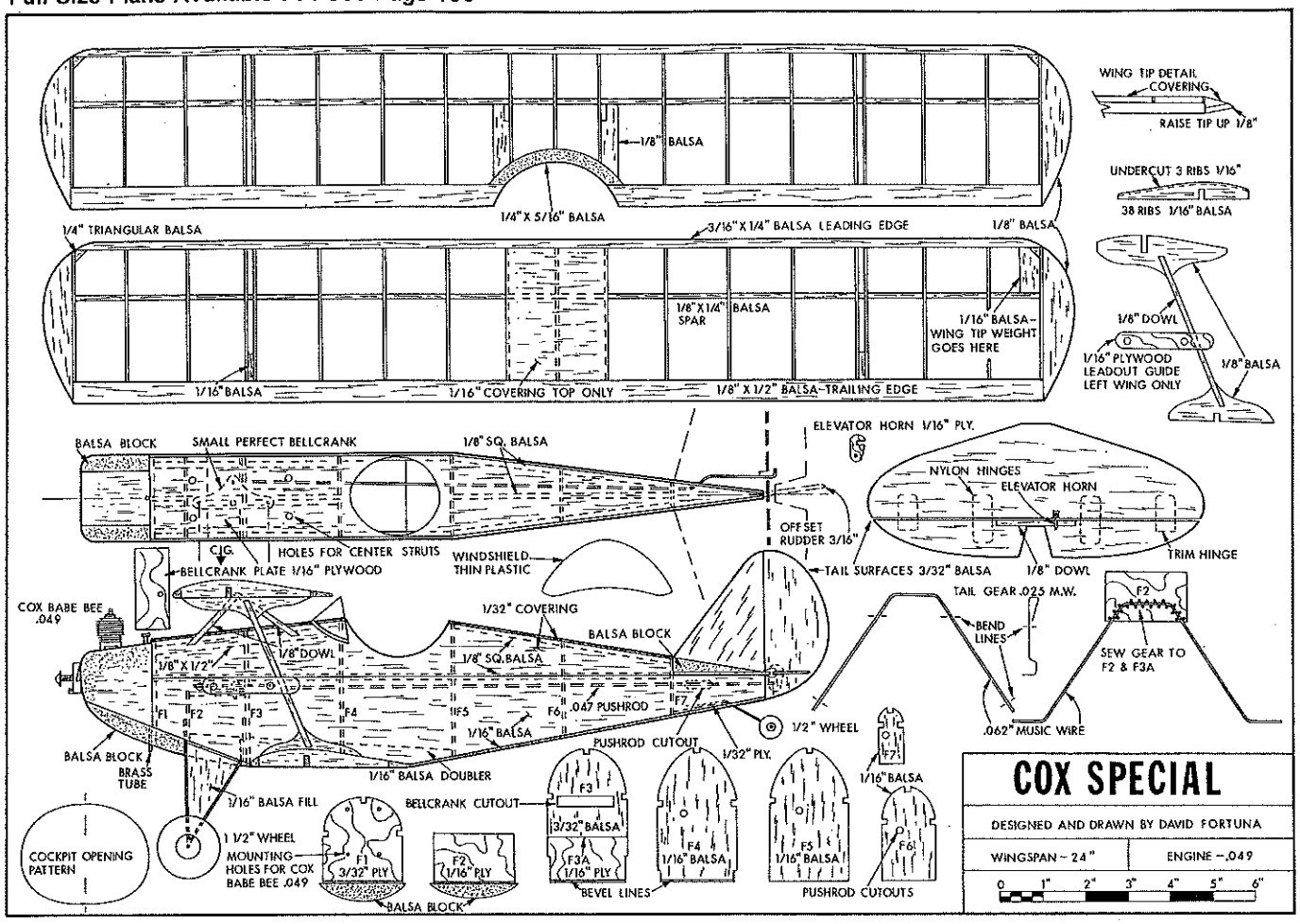
Glue formers F3 and F3A together, then spot glue them in place on the fuselage. The





Left: The partially assembled fuselage prior to sheeting the top with 1/32 balsa and adding the nose side blocks. The bellcrank and control wires are installed. Note the ⅛ x ½-in. balsa strips between F1, F3, and F4 with mounting holes drilled for the center struts. The 2-56 blind nuts are already installed in the firewall. Right: The main landing gear has been bent to shape and sewn to former F-2 with ½A Dacron flying line. The landing gear and Dacron line are coated with epoxy or CyA (cyanoacrylate). This assembly is then glued in place in the fuselage structure.

Full-Size Plans Available . . . See Page 196



easiest way to bend the rear gear wire is to make a pattern beforehand using a soft wire such as florist's wire. After making any adjustments necessary for a good fit, bend the rear gear itself out of the .062 music wire. Once you're satisfied with the fit, mark the gear outline on F3. Break the former from the fuselage, then join the gear to F3 as before and glue it in place. When this is dry, bind the gear legs together with soft copper wire and solder the legs together.

Drill a $\frac{3}{32}$ hole in the plywood bellcrank plate. Slide the plate in place, and glue it well. Bend the pushrod and lead-out lines from music wire. Add the lead-out lines to the bellcrank, then mount the assembly in the fuselage. Add the pushrod, securing it to the bellcrank with copper wire and a drop of solder. Temporarily place the stabilizer and elevator in position, then hook up the pushrod and check the control system for smooth operation.

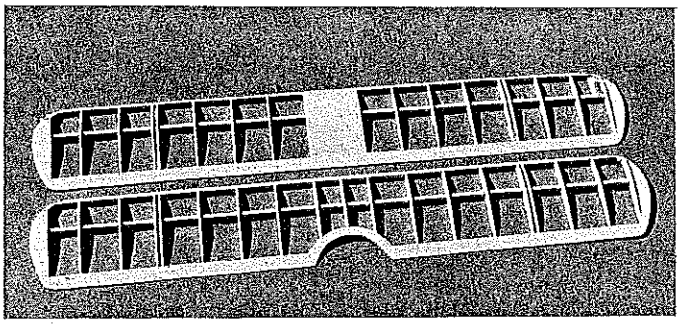
Drill mounting holes in the firewall for the 2-25 blind nuts. After installing the blind nuts, I put a little epoxy on the backs of them for added security. Glue the firewall in place, then add the ⅛-in.-sq. balsa top stringers. Bend the tail gear from .025 music wire, and epoxy it to a piece of $\frac{1}{32}$ plywood. Glue this to the inside of the fuselage, flush with the sides.

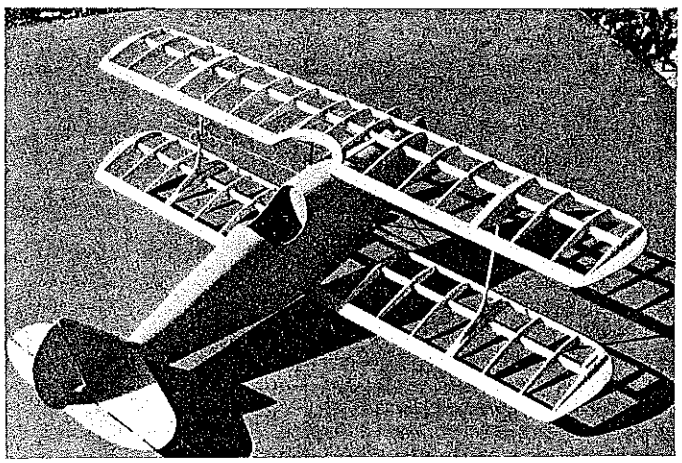
Cut the ⅛ x 2 x 4¼-in. fuselage bottom block to a rough shape, then glue it in place along with the nose side blocks. The ⅛ x ½-in. balsa strips to which the center section struts will be mounted are glued between F1, F2, and F3. Sheet the fuselage top with $\frac{1}{32}$ sheet balsa. It's best to use two pieces and join them along the fuselage top; I had to cut the sheeting to bend it around the cockpit area where the contours change.

Glue a piece of $\frac{1}{16}$ balsa between the fuselage sides for mounting the stabilizer. Sheet the fuselage bottom. Sand the nose section to shape, then locate and drill holes for the center section struts.

Glue the stabilizer in place, add the filler block, and sand to shape. Glue the fin in place. Make a paper pattern of the cockpit outline, and lightly cement it in place. Carefully cut around this pattern for the cockpit opening. Glue the bottom wing in place, checking alignment beforehand.

Continued on page 168





Above: The finished and sanded upper and lower wing panels. The wing tip weight has been epoxied in the lower right wing tip. Note the double ribs where the struts attach. Right: The finished model prior to covering. The cockpit opening is cut out after sheeting the fuselage top. The top wing, wing struts, rudder, and elevator are glued in place after the structure has been finished and covered.

demands require top fitness. I would still be flying FAI if I could only keep up around the pylon!

Speed trials for the team to represent the U.S. at the 1990 World Championships were also held at Dayton. Four contestants entered, but wind, rain, and tough luck were hard on models. Carl Dodge had his new, state-of-the-art model (thin, high-aspect-ratio wing, stabilizer laminated with carbon fiber for stiffness, and his immaculate homemade engine) which crashed when the handle line connector failed! Carl has been turning world-class speeds with this model and managed to rebuild it for the second team trials in California.

Bill Hughes (Bolingbrook, IL) qualified with a 146.20-mph speed at Dayton, and then upped it enough to be the third man on the U.S. team. He has had flights over 170 and has really worked hard to get there. He has been trying for several years, has paid his own way to the World Championships twice just to learn and observe, and has gradually improved his speeds until he made the team. John Newton is the other team member. Ed Gifford turned a 136.54 time at Dayton, while Raul Diaz had a multitude of troubles.

Bill Hughes is one of the few relatively young Speed fliers left. Not only speed, but all modeling is hurting due to the lack of young competitors. The kids are out there playing video games, and know almost nothing about building and flying airplanes. Many of them are buying RC cars, because the only requirement is to bolt things together.

A lot of people are talking about the "Junior problem," but I don't think anyone knows what to do about it.

It is difficult to get anyone started in competition. All the events are highly sophisticated and leave nothing for a beginner. That is why we began the .21 Sport Speed event. It's low-key, easy to fly, easy to build, and requires equipment that is readily available. Try it, and try to get others interested.

The Texas boys have an event with similar objectives called Sport Jet Speed. The rules specify stock Jet engines, two-line controls, and a standard fuel. Speeds are around 140 mph, so no great talent is required to fly them. It sounds so good I think I'll build one! I'll get more information for a future column.

Cox Special/Fortuna

Continued from page 72

Fill in any cracks or imperfections with balsa filler, and smooth down all the fuselage parts with 320-grit sandpaper. Be careful around the turtledeck, since the balsa is only 1/32 thick in that area. Epoxy 1/16 balsa between the landing gear legs, and add a drain tube under the fuselage bottom. Fuelproof the firewall and inside the cowling with a coat of epoxy glue or fiberglass resin, being careful to keep it off the blind nuts.

Covering and final assembly. I used lightweight silkspan to cover the wings. Sig Manufacturing Company carries a lightweight Japanese tissue, called Lite-Flite plyspan tissue, which will also work well. The Lite-Flite comes in a variety of colors and can be applied wet like silkspan. I don't recommend using iron-on covering, since it can warp a lightweight structure if it's shrunk too much.

Before applying the silkspan, brush two coats of clear dope on all areas to be covered. Lightly sand the dope with 400-grit paper when dry.

Apply the silkspan so that the grain runs spanwise in covering the wings. I always wet the silkspan before applying it. Once the wrinkles are worked out, brush clear dope through the silkspan along the leading edge, trailing edge, and tips. The wing strut openings are cut out after the wing has been completely covered. I covered the fuselage and tail surfaces to give the model a better finish, but this is optional.

For a final finish, I brushed three coats of clear dope on the model, followed by three coats of dope and talcum powder. After sanding this down well, I sprayed on several coats of colored dope. I trimmed the model to resemble an aerobatic biplane, which typically sports a flashy paint scheme. A final coat of clear dope was sprayed on to protect the finish and add more gloss. For a lightweight model, three coats of dope would be an acceptable finish.

If you're using nylon hinges on the elevator, epoxy them in place before installing the elevator. Be careful not to get any epoxy on the hinge pins. Install the elevator, and glue the rudder in place, offsetting it about 3/16 in. to the right.

An open-cockpit model needs a pilot at the controls to look authentic. I used a Williams Bros. 1½-in. scale standard pilot, although I had to doctor the poor guy by cutting off his shoulders a little to make him fit.

Before gluing in the top wing, check for

proper alignment by mounting it to the outboard wing struts and dry fitting it in place. Once you're satisfied with the alignment, glue the struts in place and allow for thorough drying. The center section struts are ⅛-in. dowels. These are cut so that they protrude about ⅛ in. into the fuselage and wing. Paint the dowels before gluing them in place.

Cut the windshield from thin plastic, and epoxy it in place. My model uses commercial 1½-in. rubber wheels, but the 1⅞ plastic wheels which are available from Sig would be considerably more lightweight. Finally, install the engine and check the center-of-gravity.

Flying. Do a preflight check to make sure the controls operate smoothly. I used a Cox gray 5½ x 4-in.-pitch propeller, together with an Ace 1-in. spinner. Wait until no wind is blowing to make your first flights, and use 30-ft. lines. Because of their greater wing area and higher drag, biplanes customarily can't handle as much wind as other airplanes. In compensation, there's certainly nothing prettier in the air.

If you don't live near a well-stocked hobby shop, everything you'll need to build and fly the Cox Special can be purchased directly from Sig Manufacturing Company at 401 South Front Street, Montezuma, IA 50171. Refer to the company's catalog, which costs $3, for current prices and stock numbers.

Many happy landings!

FF Duration/Murphy

Continued from page 75

Unless I am mistaken, the intent of the original Nostalgia Gas concept was to utilize the engines (or power equivalents) of the era as well as its model designs to produce representative power and flight characteristics associated with the specified time frame. I hope the philosophy of this theorem does not become lost in the shuffle as the popularity of the NosGas events increases with time.

This is probably as good a spot as any to compliment Ralph Prey and Bob Larsh for maintaining their positions as stern disciplinarians in their capacities as guardians of the NFFS Nostagia Gas rule book. Whether it be a game of toy aeroplanes or stud poker, the more concessions that might be permitted to the "loopholer," the more contaminated the game might become. In either case, should the winnings begin to shift in the direction of the nonconformist on a regular basis, the dangers are that possibly some of the other players could become disenchanted, or possibly even quit the game altogether.

Ralph and Bob have continually taken deliberate steps to thwart any offbeat rules interpretations in this regard by issuing ongoing decisions on questionable designs, along with model construction guidelines. These clarifications are accompanied by official NFFS "Design and Engine Availability" lists.

The latest information on all accounts is available at cost by sending $1.75 to Bob Larsh, 45 South Whitcomb Ave., Indianapolis, IN 46241. Hot off the presses as of January last, Book #3 contains the latest clarifications and design listings, so interested Contest Directors and contestants alike may wish to order copies for the coming contest season.

Also, the only basic rule change under consideration at this time is the proposal to change the NosGas Ignition event from "special" event status to an "official" event. This event has been around for two or three flying seasons and has enjoyed increasing participation, especially with Midwest NosGas buffs.

Whereas some have always felt that all of the vintage ignition-engine competition should more appropriately fall under the protective wings of the Society of Antique Modelers (SAM), the SAM folks have repeatedly shown little interest in recognizing the second half of the ignition-powered era—that is, those published or kitted ignition-engine-powered designs of the 1942-50 years.

At any rate, the relatively new NosGas Ignition activity is certainly signifying that there are definite vital signs of interest within the vintage-modeling community.

New rule proposals for the AMA Gas classes seem to have been at a low ebb for some time. This is not to say that constructive revisions are not required, but more than likely that viable solutions to the problems are not that readily apparent.

Although I do not wish to present myself as the national guru in this matter, it is my observation that domestic competition in the AMA Power classes of A, B, C, and D present a mixed bag in some geographical areas.

Using the Midwest as a case in point, it would appear that in the past couple of years, event participation in these power classes has generally fallen off considerably at even some of the larger contests. Often there are uncontested trophies for the events that are left on the tables after the close of the award ceremonies at area and regional con-