

An R/C SOS

Bebe Jodel D-9

A Stand-Off R/C Scale of an aircraft that even looks as if it were a model. The gentle flight characteristics of this fine homebuilt have made it popular with pilots/**Doc Mathews**

Powered by converted VW engines abandoned by the retreating Germans at the end of World War II, the simple all wood Jodel D.9 Bebe was a boon to the post-war European sport flying movement. Approximately 700 Bebes have been built in France and elsewhere since 1948. The Bebe is truly a "baby" in that its span, a mere 23 feet, its length 18 feet, and 2 poly-dihedral wing gives it the illusion of being an oversized model airplane. Construction is all spruce, with plywood and fabric covering. The undercarriage is rubber sprung, and the rudder is all moving with no fin.

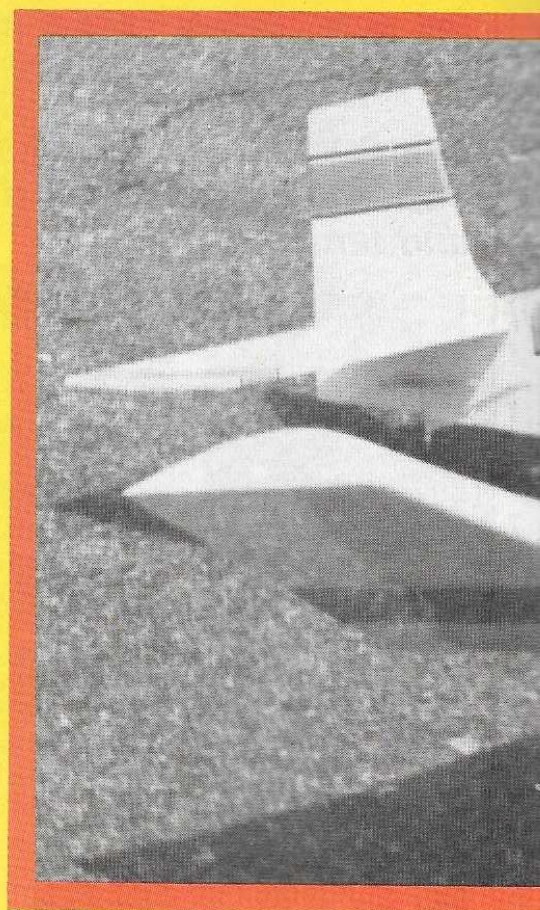
The Bebe Jodel has ideal moments for scale model use, that is obvious, as is its complete lack of complex curves and ellipses. These appealing virtues have induced several scale model of the Bebe to be published and several kits to be marketed over the years (many of us fondly recall a Free-Flight Jodel marketed by Midwest for many years). Strangely, the Bebe has never been selected as the subject for an R/C trainer, at least not to my knowledge. Knowing that the subject possessed sufficient inherent stability to fly in the Free-

Flight scale mode, I felt certain it would be an excellent aileron trainer if developed in a simple-to-construct form. My expectations have been amply rewarded with a model of delightful appearance and superior stability.

This project is directed primarily at the newcomer to our hobby, who has built and flown (successfully) several beginner type trainers such as the Sig Kadet, and is now considering advancing to an aileron airplane that his current engine and hardware will fit. That the Jodel's construction techniques are strongly Sig Kadet-like is not an accident on my part, as I felt that the newcomer would be comfortable using a wing building method with which he was familiar, even though it is mounted on the fuselage bottom, and has been modified for the use of torsion-bar landing gear. The fuselage is strongly Formula 500 in construction style, as I admire the extreme simplicity and fail safe alignment of these designs.

The objectives of this project were:

1. Kadet like construction and flying characteristics.
2. A low wing aileron equipped model sized for .29 to .40 engines.



PHOTOGRAPHY: DOC MATHEWS

3. Scale appearance with an opportunity for each individual builder to create a distinctive looking model.
4. Easy maintenance of the systems with good accessibility and repairability.
5. Rugged and durable design to survive the inevitable bad landings and rough handling

Although directed primarily at the beginner at the second level in flying skills, the model possesses enough eye appeal and flyability that it is also a delightful Sunday sport flyer.

General Notes

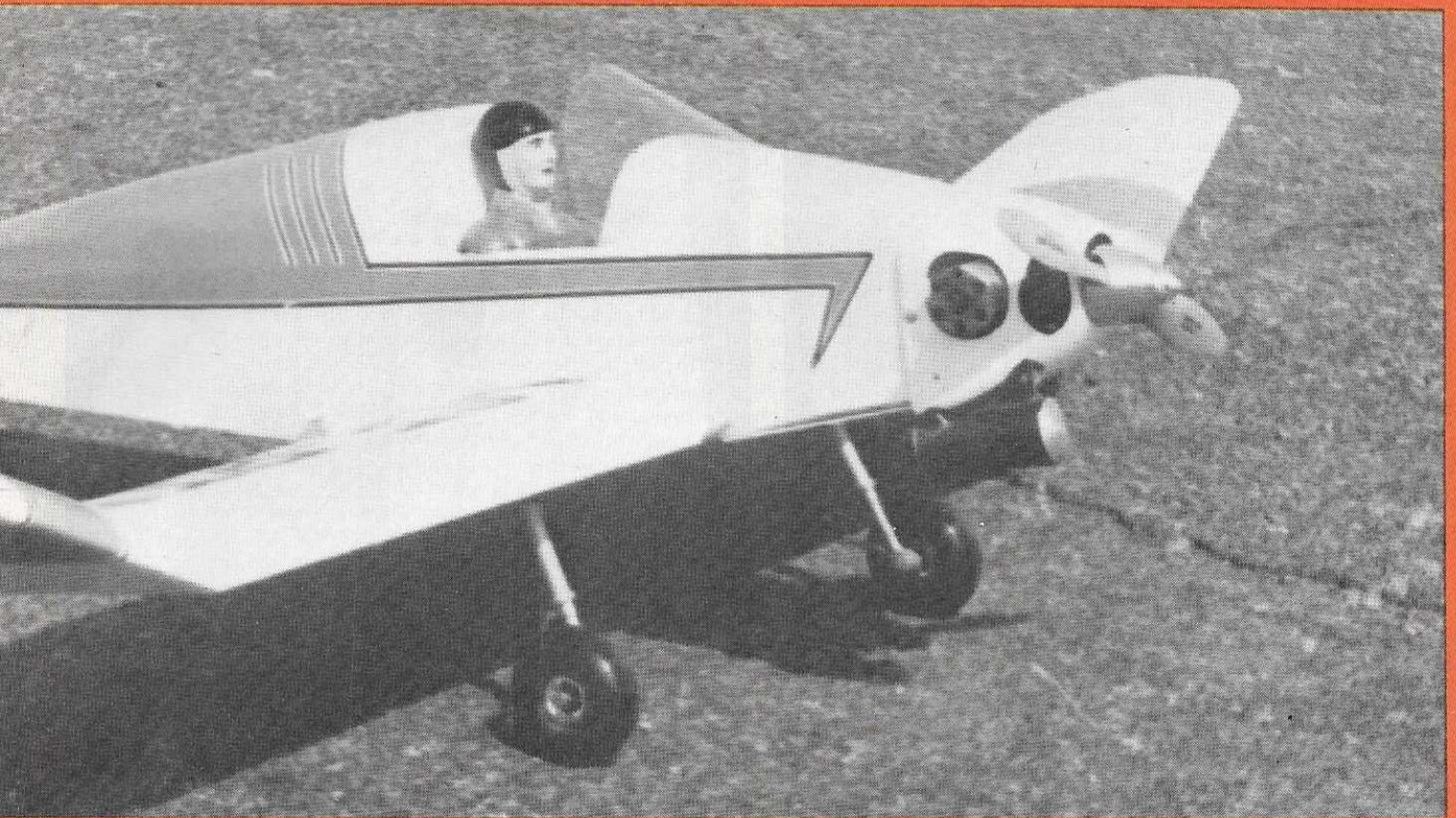
All references to glue in this article refer to Aliphatic resins such as Sigbond, this is the primary adhesive for the entire building project. Epoxy refers to the 2 parts to 1 part types such as Formula II. No 5-minute epoxy should be used. The abbreviation C.A. stands for cyano-acrylate, the generic name for the likes of Hot Stuff, Jet, Zap, etc. The cowl is a Sig catalog item and is available through your dealer or direct from Sig. All other hardware is easily obtainable, as every effort has been made to avoid the exotic or unusual.

The cloth used over the foam is "Dynel", available from aircraft suppliers as it is used in the construction of the Rand and Varieze home built aircraft. To my considerable surprise, Hobbyproxy E-Z Does It cloth appears identical to the Dynel. The foam itself can be either beaded styrene (Styrofoam brand name) of poly-urethane. I prefer urethane foam for its superior carving and sanding characteristics, but it is more difficult to purchase. However, if you can locate someone in the midst of constructing a forementioned homebuilt, his scraps and chunks will supply you with enough poly-urethane to construct this and several other models.

I would be remiss were I to fail to warn



You'd swear a model builder designed the Jodel. Maybe one did. It makes a very fine mannered R/C design, and scale-like to boot. Photos on facing page capture a variety of angles, overall simplicity.



anyone considering cutting this product with a hot wire that the resultant fumes are extremely toxic. If the first cutting doesn't put you away, the second or third will, as the toxicity is cumulative; that is, your lungs and liver do not detoxify the stuff, they merely store it. This dangerous phenomena is also encountered when using epoxies, polyurethane and polyesters as paints *in a closed space*. This is a great hobby, but not worth dying over.

The Fuselage

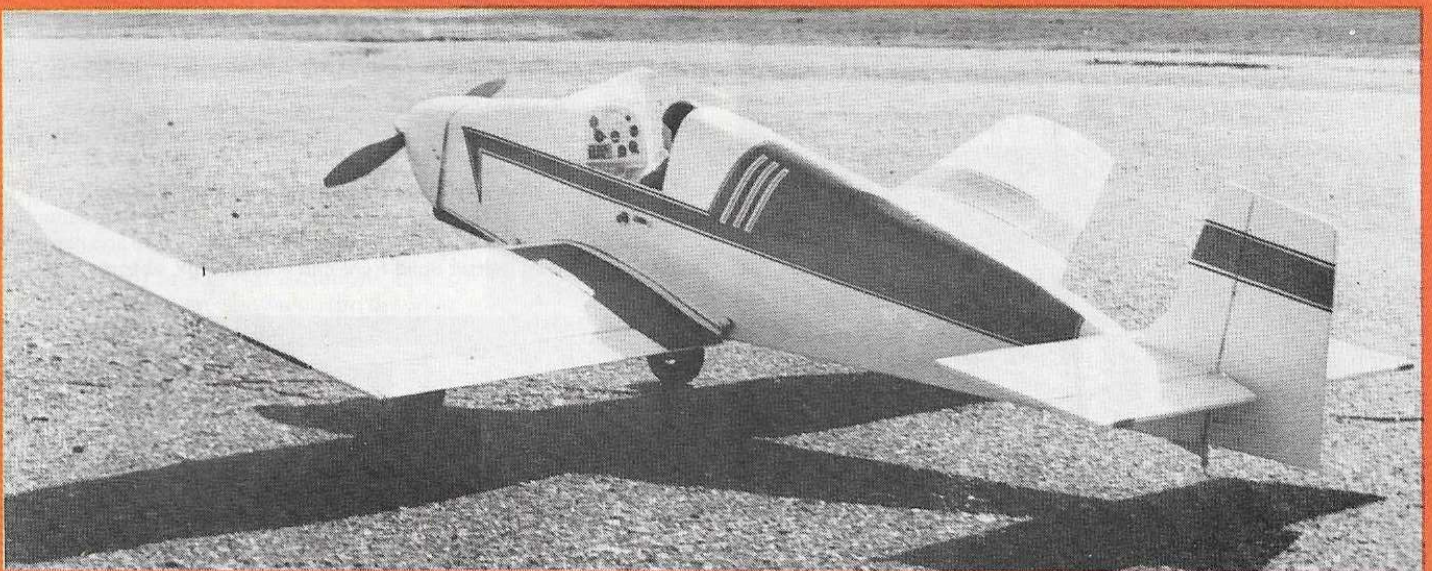
Develop two identical sides by tracing the plans with carbon paper over the wood. Drill holes in the fuselage sides for the wing dowels (if the bolted-on wing option is not being

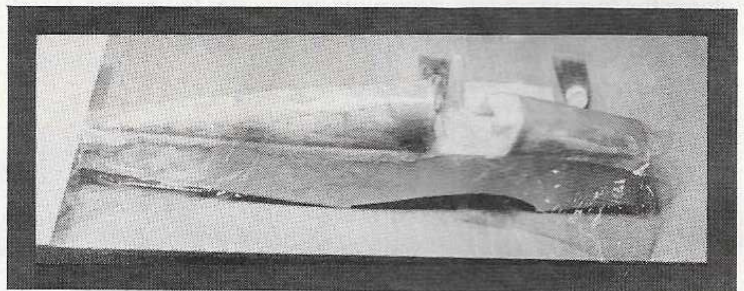
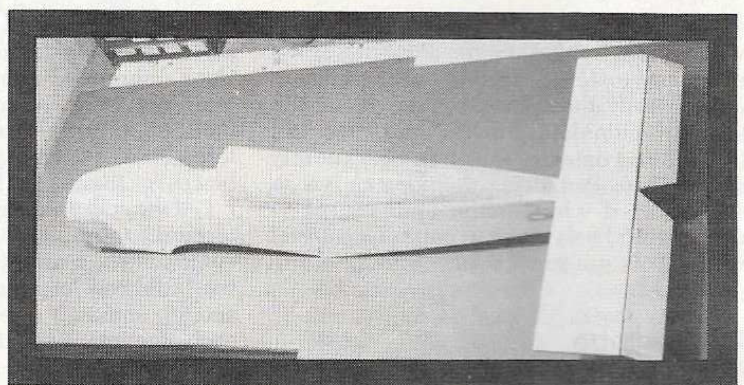
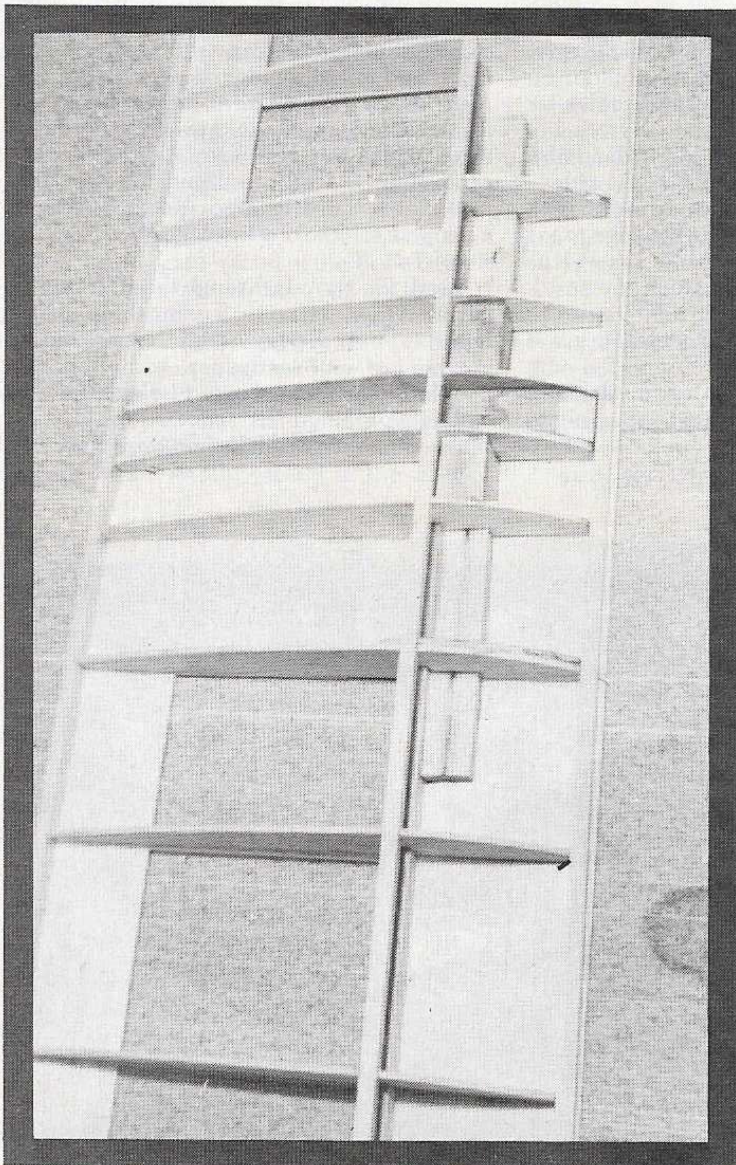
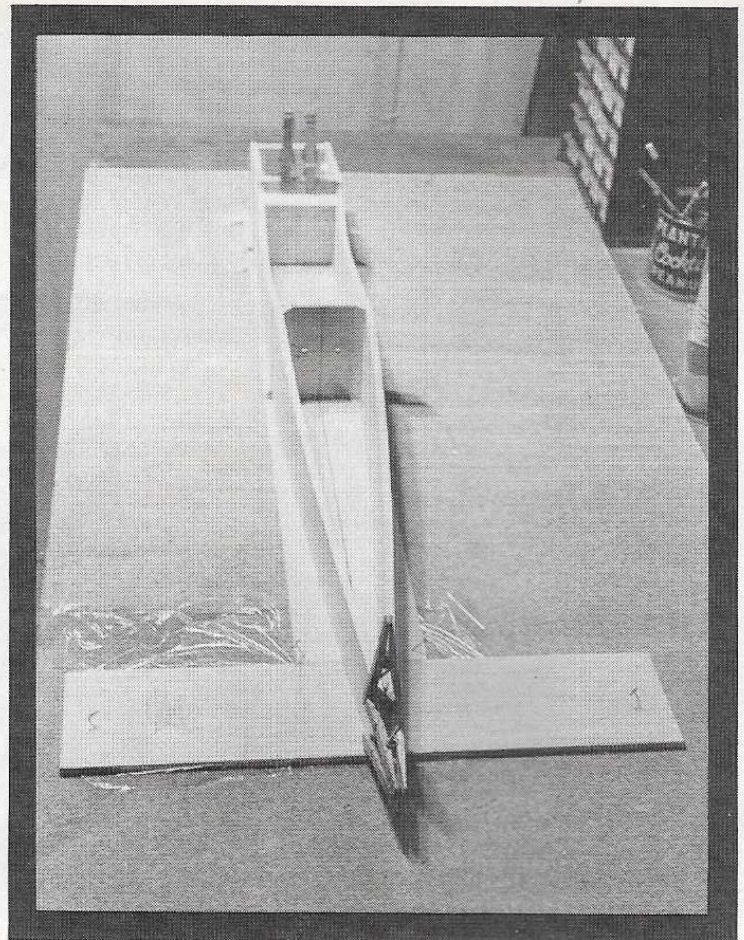
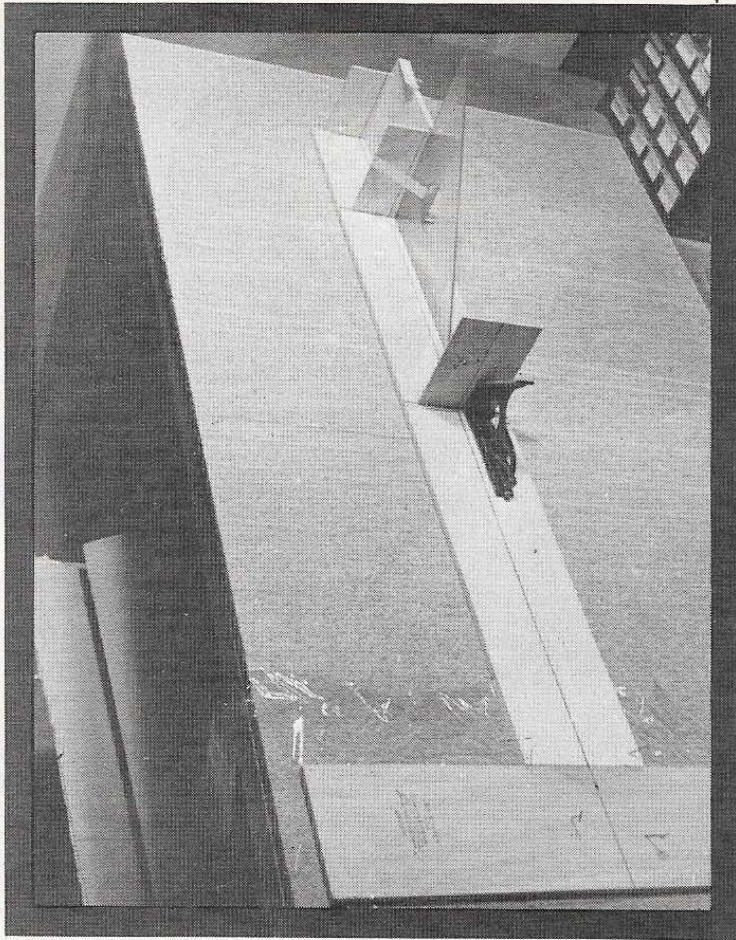
used) after installing the doublers. *Be certain you are making a left and a right side.* Cut F-1 through F-4 from 1/8th ply, marking a mid-line vertically on each. Drill holes for fuel line, throttle pushrod, and Nyrods before assembly. Epoxy the triangular balsa braces for the firewall and F-4 to the sides.

Cut the stab and mark a centerline on both top and bottom surfaces. The fuselage top is cut to length, a centerline marked as well as the bulkhead locations. Position the fuselage top and stab directly at right angles to each other using the lines as a reference and epoxy the joint. Glue F-2, F-3, and F-4 onto the top positioning F-2 with a scrap sheet jig for the proper downthrust angle. (See photo #1)

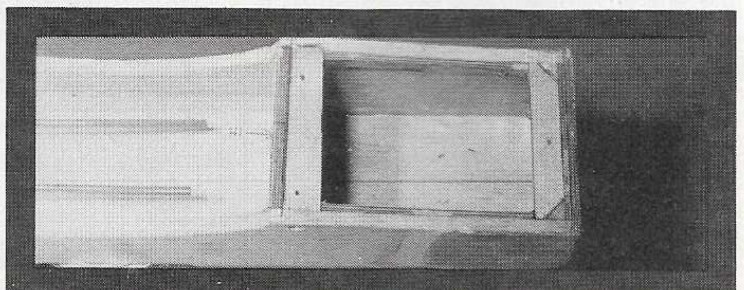
When this assembly has cured sufficiently, glue the fuselage sides to the bulkheads and top, drawing together at the rear over the centerline. Use clamps, clothespins and masking tape to hold everything in position while the glue sets. As long as the centerlines are followed and the fuselage top is flat, it is nearly impossible to construct a warped or crooked fuselage. *Now that is simple!*

Install the Nyrods through the slots previously cut in the tail area, feeding through the holes in F-4. Epoxy outer Nyrods after roughening with sandpaper. Add ply hatch doublers and frame. Cover fuselage bottom with cross-grained 3/32" sheet. Allow glue to set, then remove fuselage from work surface.





Dinell and epoxy over polyurethane foam held by Saran-Wrap works well for Doc. Shots at top show simple fuselage in stages, aligned on centerline. Could not be much easier. **At left:** Note center wing structure and hardwood gear blocks. **Down below:** Solid front end shields tank, absorbs vibration.



Epoxy F-1 onto front of F-2 adding 4x40 blind nuts by temporarily positioning the mounted motor.

Cut the outer Nyrods flush with the fuselage sides, gaps may be filled in with epoxy and micro-balloons, then sanded flush with the fuselage sides. Cut and sand fuselage top sheet to match sides. Epoxy ply tail wheel bracket support in place. Wrap nose with glass cloth and finishing resin.

Cut foam blocks to rough outline and glue to fuselage top. After glue has set use scraps of foam block to contour and shape the top. The most effective sanding block is the foam itself, the rate of reduction when using foam on foam is rather amazing so go slowly at first. Contouring should be done in an open area (like outdoors in your neighbor's driveway) as the "dust" is extremely difficult to control inside the workshop.

Cut Dynel (Easy Does It) cloth to rough size, smooth out over the foam then use warmed Formula II or its equivalent to paint the cloth onto the foam. The first coat should be brushed through the cloth to stick everything down. After the epoxy begins to set, trim the cloth at the fuselage side for a flush joint. Final sanding is done *after* complete setting. Close examination of photos will reveal the use of vinyl spakling compound on the foam before application of the cloth. Although this does produce a smooth working surface, the cloth can be filled and smoothed later with a mixture of microballons and epoxy if the builder wishes.

The second coat of warmed epoxy is brushed onto the cloth in a heavy filler coat, then forced into the cloth with sheets of Saran Wrap pulled tightly. A third thin wash coat may be required for a smooth finish after the second sanding coat with 220 paper. The final finishing steps will be completed with the remainder of the fuselage.

Tail Feathers

Cut fin, rudder, and elevator from firm sheet, bend and epoxy the joiner wire before cutting slot out of the elevator. Articulate with pinned hinges, then sand and contour. Install fin to the stab. With a generous amount of epoxy forming a fillet (Formula 3 Hobbyepoxy is superior for this application) at the base by smoothing it out with a moistened finger.

Wing Assembly

Trace main wing rib pattern onto a piece of scrap 1/8th ply, cut out, then use this pattern to stack cut the wing ribs. Tip ribs, with the exception of the 3/16" sheet joint ribs, are actually main rib blanks cut without the spar notches, then trimmed off to match the required length using a straight edge to slice off at the bottom. This method of rib cutting produces built in wash-out by progressing the high point in the airfoil toward the trailing edge as the tip tapers down. The concept is not new or revolutionary at all, it *is* a bit confusing until one gets it sorted out in his mind. The tip ribs are shown on the drawing for those who prefer to trace and cut them in pairs.

Pin the leading and trailing edge sheet over the protected plans, fill in between with capstrips, use ribs as guides to position and glue spars and leading edge onto the sheet. Allow glue to set, then add top sheeting and capstrips. The same basic steps are used to construct the tips. Be certain to tilt the joint rib using the jig as drawn.

The landing gear mounting blocks are

pre-grooved catalog items, they are inset into the lower center-section sheeting and the notched ribs epoxied over them. The hard balsa or pine in-fill blocks as illustrated in photo are used to stick the upper portion of the music wire into, and to provide a solid surface into which the 1/4" retaining dowel can be epoxied. If a dowel and elastic wing hold-down is selected, the center filler is unnecessary.

Remove wing from the building board, contour and carve the leading edges, etc., then dihedral tips using the classic sanding block and table edge technique. Epoxy tips onto center-section, cut slots for ply gussetts with a pair of hack saw blades taped together, epoxy gussetts, tip blocks and aileron horn bearings into place.

Reinforce center-section with 4" wide glass tape and surfacing resin. Three coats of resin, or epoxy, well sanded between coats will fill the tape and allow for feathering into the surrounding sheet. After the first coat has set, cut the tape free over the aileron servo cut out. Fit and hinge the ailerons checking for a bind free system.

Finishing Notes

The photo model has MonoKote on the wing, and Perfect brand poly-urethane paint on the remainder. We are now pre-coating the bare wood areas, to which MonoKote will be applied, with Coverite "Balsa-rite" for improved adhesion. The remainder of the wing covering steps are straight off of the package instructions.

All bare wood areas are given two sealing coats of nitrate dope, sanded with #400 paper to remove the fuzz, and everything filled with two coats of K&B Superpoxy filler. The surfaces are then sanded smooth and sprayed with two or three coats of urethane paint. The cowl plastic accepts the paint well, if care is taken not to apply the paint too thickly. The numbers are sticky vinyl items from the office supply store, the trim itself is vinyl trim tape, scale details are limited only by the builders imagination. The windscreen can be held in place with Wilhold Formula 54 adhesive. The tank compartment will need to be flooded with finishing resin or warmed epoxy before the tank is installed.

Final Assembly

Mount control horns. The tail wheel wire tiller is straddled by the rudder horn for additional strength. Mount your engine and tank and landing gear. Move servo and receiver fore and aft to find an optimum center

of gravity, then permanently mount, using bass-wood blocks or a Serv-mount from Buckeye Balsa. Connect the Nyrods, trimming for neutral position. The degree of deflection for the surfaces can be set by varying the position of the connector on the horns. First flights should be at deflections stated on the plan. The aileron hardware is at the builders option, but the Du-Bro AH-13 units work well for us.

Check the engine operation, adjusting throttle for high and low settings, check radio functions with the engine running, retighten everything then head for the flying site.

Flying

The Bebe Jodel flies much like any other low winged flat-sectioned intermediate trainer. However, since it is a tail dragger, a bit more finesse is needed on the runway, especially for those accustomed to trike gear. On a rough surfaced runway avoid sudden advances of the throttle as the built-in down thrust, coupled with wheel drag, will tend to nose the model over. Use only moderate rudder deflections under high thrust settings to avoid spinning around like a top. The tail wheel does not need to be held down for any great length of time as the rudder becomes quite effective for steering with just a small amount of forward speed. I do not mean to imply that this model is difficult to handle, only that many flyers who have only flown trike gear really do not know how to take a model off, they are accustomed to horsing the model off the ground then starting to fly it about four feet off the deck.

Start take-off run with all surfaces in neutral, advance the throttle to 1/2, the tail will rise up on its own at 10 to 15 feet, as it does ease in a speck of up elevator and increase power until you are airborne. First turns should be executed after some altitude is gained. Now isn't that more artistic than "flinging your model into the air going who knows where?"

Landings are super simple. Turn onto final at half throttle, 10 feet high, and 100 feet out. Retard throttle to idle keeping nose down to maintain speed, let the model settle onto runway, applying up elevator just as it touches, for a lovely flaired set down.

As an out-of-the-rut, scale impression-intermediate trainer, the Bebe Jodel has proven to be a true delight to look upon and to fly. Should you choose to build one for yourself, I have only one further word of advice. Enjoy! ☺

