■Scott and Olin Brown

lil' bit

The long nose moment combined with the classic golden-age lines produces a model that's as good looking as it is good flying. The built-up fuselage is a nice deviation from the more common profile-type small Stunt models. Spectators can't resist commenting on its terrific looks.

THE IDEA for the Lil' Bit originated right after we built a Hurricane ½A Stunter kit. It was an inspiration, and we decided that, by George, we just ought to design and build our own—can't be that hard! But for one reason and another the idea got shelved, and we went on to other things.

Co-author and chief test pilot Scott fuels up the model for another flight. Inexpensive construction and operation are a real plus.

This past spring, however, the build-another-model bug bit pretty hard, and we resurrected our old idea of designing, building and flying an original ½A Stunter.

We started the project by establishing basic criteria for Lil' Bit. The model would have to: 1) look like a full-size aircraft, 2) be inexpensive to build, 3) be easy to build and fly, 4) be aerobatic and capable of "Stunting."

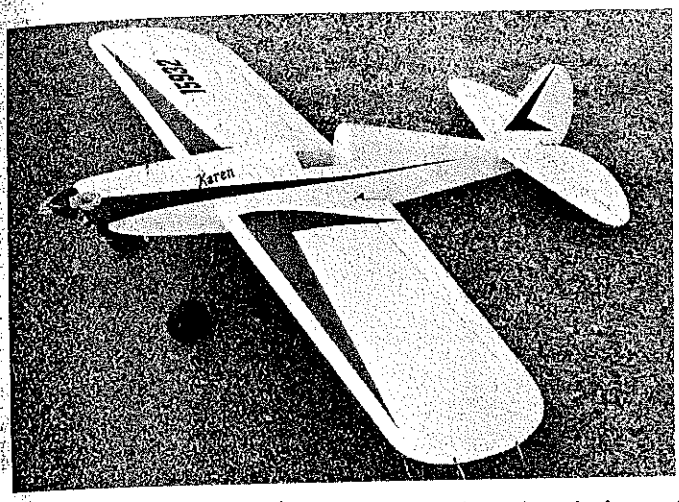
The two of us have been aviation buffs for many years and thoroughly enjoy being around both full-size and model aircraft of all description. Since we're partial to between-the-wars and World War II-vintage birds, we decided that Lil' Bit should look like a 1930s-era sportster.

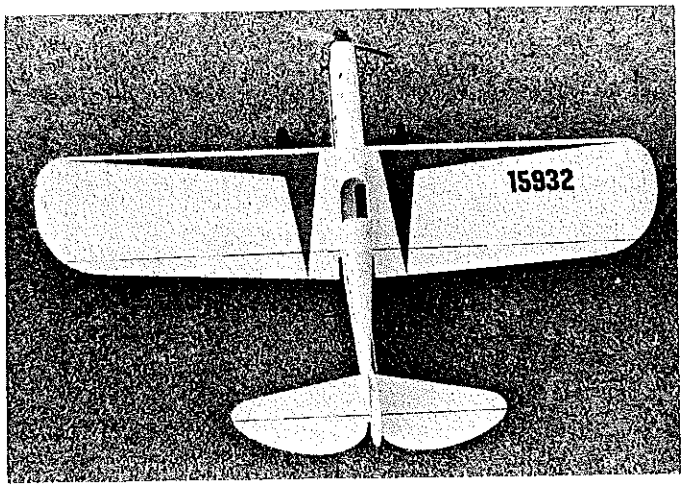
A built-up fuselage, classic aviation appearance, and predictable flying habits make this ½A model a great addition to anybody's collection of Control Line sport models.

We chose a ½A-size model because we knew the costs of both building and flying would be held to a minimum. Also, no unusual sizes of wood or pieces of hardware are required. All in all, this model met all the goals.

If you've built a profile Control Line kit or two, Lil' Bit would be a good first built-

Lil' Bit flashes by on one of her first flights. The model is a stable flier, and is capable of performing all the AMA aerobatics maneuvers.





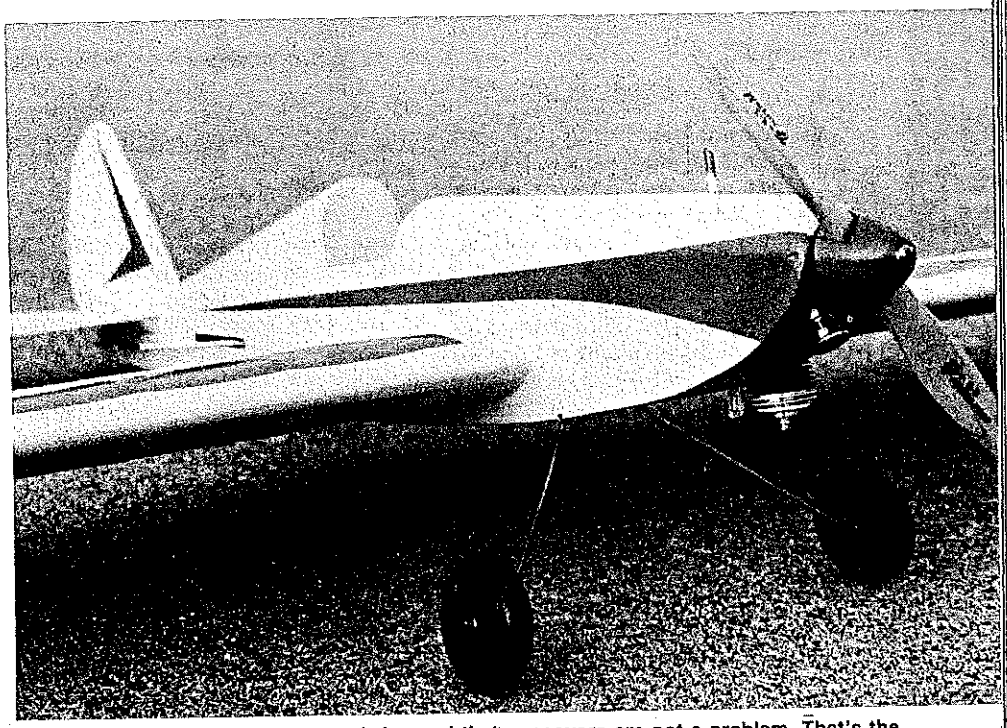
Left: The red and cream color scheme our authors chose looks great, but of course you could pick any combination to suit your taste. Right: The Tee Dee engine runs well inverted, and since the exhaust is underneath the model stays much cleaner. Note the amount of rudder offset.

up fuselage. It takes a little time to build the hollow fuselage, but it certainly isn't difficult. The bill of materials at the end lists everything you'll need. We've included some basic information and tips concerning construction sequences and techniques for newcomers; of course you old, experienced hands can just forge ahead any ol' way you choose.

Construction. First study the plans and read the text carefully to get an idea of what's to be done and the materials you'll use. We'll tackle the wing first, since it's the part most folks dread. The wing is built directly over the plans. This is best done on a flat work table or bench using a 2 x 4-ft. building board soft enough to stick straight pins into, such as Celotex. You'll also need a sheet of wax paper or clear plastic wrap (Saran Wrap, for example) to lay over the wing plan, so your finished wing won't be glued to the paper plans!

We used aliphatic resin glue throughout this model, except for two applications—the landing gear and tail skid installations. It's safe and nontoxic, cleans up with water, dries quickly, is inexpensive, and is strong as a bull! You'll know it as yellow-colored Elmer's Carpenter's Wood Glue, Franklin's Tite Bond, Sig Bond, or other brands. Remember that it doesn't take much glue to make a strong joint. As long as you get a thin coating on mating surfaces—and then hold, clamp, or pin parts together while the glue is drying—your model will be strong enough.

Another product we like is ZAR Latex Wood Patch marketed by United Gilsonite Laboratories, Scranton, PA. This is an outstanding wood filler for cracks and nicks. Packaged in a soft poly tube with a screw cap, it spreads extremely well, dries quickly, sands smooth, and takes dope. We found it at our local hardware store and have used it for household repairs as well as models.



Sig plastic wheels are set far enough forward that noseovers are not a problem. That's the lower tank vent just behind the cylinder. The 1-in. Ace spinner and wood prop add realism.

The wing is fashioned in a jig directly over the plans, to ensure a strong, straight structure. The first step is to cut out the parts for the jig. Trace the wing spar jig piece from the plan onto paper, cut it out, and glue it onto a rectangular piece of 1/16 sheet balsa slightly larger than the jig piece.

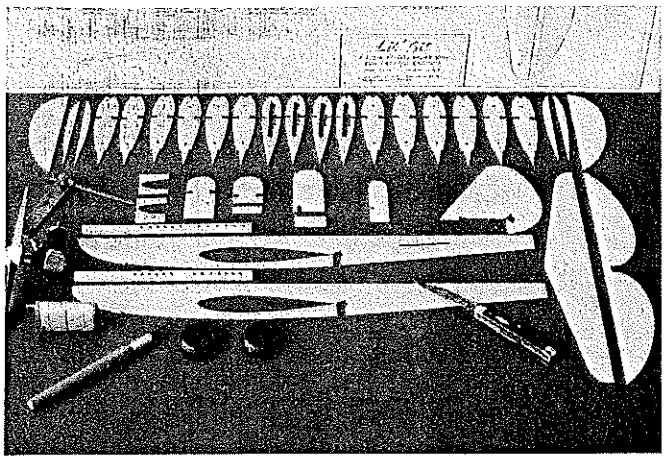
Cut out five more rectangles of 1/16 sheet the same size. Using *tiny* dabs of glue, tack glue the six rectangular pieces into a stack like pancakes. After the glue dries, and using the paper pattern glued onto the top of the stack as a guide, cut out all six jig pieces at once. Since the wing spar jig pieces must all be exactly the same size and shape to ensure proper wing alignment, it's important to cut and sand carefully.

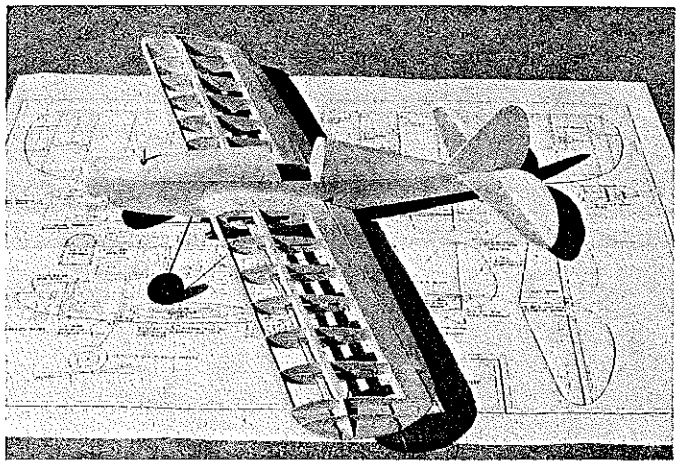
Gently split the six pieces apart with a thin knife or razor blade, and voila!—you should have six identical wing spar jig pieces! This stack method of cutting out identical parts is quick and accurate.

The main wing ribs are made the same way, except that templates (patterns) of thin sheet aluminum, brass, or plywood, cut to the identical shape and size shown on the plans, are used. Tack glue the templates together before cutting them out to ensure that they are identical. Drill two 1/8-in.-dia. holes, one at each each end of the horizontal slot in the rib.

Cut out 12 W-1 rectangular wing rib blanks, making them slightly larger than needed. Tack glue the blanks into a stack. When the glue is dry, drill 1/8-in. holes through the entire stack, using the holes in the rib templates as a drill bit positioning guide. Split the two rib templates apart, sandwich the stack of blanks between the templates, and bolt the whole stack together with 1/8-in.-dia. bolts and nuts. Saw or carve and sand the stack of blanks into finished wing ribs, using the hard templates on each end as guides. After final sanding of the stack, remove the bolts and templates, split the ribs apart carefully, then cut out the slots in the center of the ribs.

Make up a kit of the balsa sheet wing parts. From 1/16 sheet, cut out the four W-2 wing ribs, four wing tip ribs, and four wing





Left: Cut out all sheet parts first to make assembly easier. Note the holes drilled in the engine mounts to lighten them. The ribs in the left wing panel will be notched later to allow clearance for the lead-outs. Right: The completed airframe ready for covering. Note the clearance notch in the lower nose sheet for the needle valve. Latex wood filler was used to make the wing fillets. Lead-out guides are made from brass tubing.

tip gussets. From 3/32 sheet, cut out two wing tips and the two flap halves. Finally, cut the flap joiner from 3/32 x 1/4-in. hardwood.

Put the flap parts aside for now. Begin the wing assembly by pinning the wing plan to your building board and covering it with wax paper. Pin the six wing spar jig pieces onto the plan so that they are standing upright on the dotted line positions shown, with their square spar slots at the top. Push straight pins at an angle down through the lower portion of the jig pieces and into the board. Two pins inserted into each side of the jig should hold it securely.

Cut two 1/16 x 3/4-in. trailing edge (TE) strips, two 1/4-in.-sq. spars, and the 1/4-in.-sq. leading edge (LE) to length as shown on the plan. The spars, TE, and LE strips are all the same length. Pin a TE strip over the TE drawn on the plan, holding a straightedge against the strip as you pin it down to keep it lined up. Lay one of the 1/4-in.-sq. spars into the jig slots, positioning the spar ends to line up with the plan. If the jig pieces were carefully cut out and pinned onto the plan, the spar should lay in the jig as straight as an arrow!

Begin gluing the main wing ribs W-1 and W-2 into place. Note that W-2s are in the center section of the wing and the W-1s are in the outboard. Squeeze a little glue on the rear edge of each rib where it will contact the TE, and also in the square spar slot, and then press the rib into place. Carefully align each rib over the plan, checking them individually, after installation, with a small square or drafting triangle to ensure that they are vertical.

After all main ribs have been glued to the lower spar and TE, assemble the flaps. Note that the joiner strip is inset into the leading edges of the flap halves. Pin the flap halves onto the wing plan in their respective positions, and glue the joiner strip in place. Pin or weight the entire flap assembly onto your board so that it will be straight and flat when the glue dries.

Install the control system in the wing. The total "pull" of a flying Control Line model is borne by the control system—the handle, flying wires, lead-out lines, and the bellcrank and its mounting. To help ensure a long life for the model and the safety of the pilot and spectators, the control system must be rigged securely. A broken or dislodged flying wire, lead-out line, bellcrank or its mount, pushrod or control horn almost always results in a crash. Take the time to check your control system, flying wires, lead-outs and control handle connections, pushrod connections, and control horn integrity before each and every flight.

Attach the lead-out lines to the bellcrank using the safe method shown in the AMA rule book. If you're a newcomer and don't know how to attach lead-outs to the bellcrank, or flying wire clips to the outboard ends of the lead-outs, ask a veteran Control Line flier or your local hobby shop manager for help. Cut out a 1 x 3⅜-in. rectangle from 1/8-in. plywood for the bellcrank mounting platform. Drill the bellcrank mounting bolt hole at the point shown on the plan, then glue the mount in place in ribs W-2 and on top of the lower spar.

Thread the free ends of the lead-out lines through the slots in the ribs of the left wing. Position the bellcrank, and install it onto the plywood mount according to the manufacturer's instructions. Glue the upper spar in place, pinning it to the ribs. Bevel the mating surfaces of both TE strips slightly to give a flat gluing surface about 1/8-in. wide. Pin and then glue the upper TE strip to the ribs and to the lower TE strip at their rear edges.

After the glue sets, remove all pins and lift the wing out of the jig. Remove the flap assembly from the board, and lay it safely aside for now. The wing tips are most easily installed with the wing standing on end. Glue the tips to the outermost ribs, making sure they're lined up parallel with the wing leading and trailing edges. Glue the wing tip gussets in place.

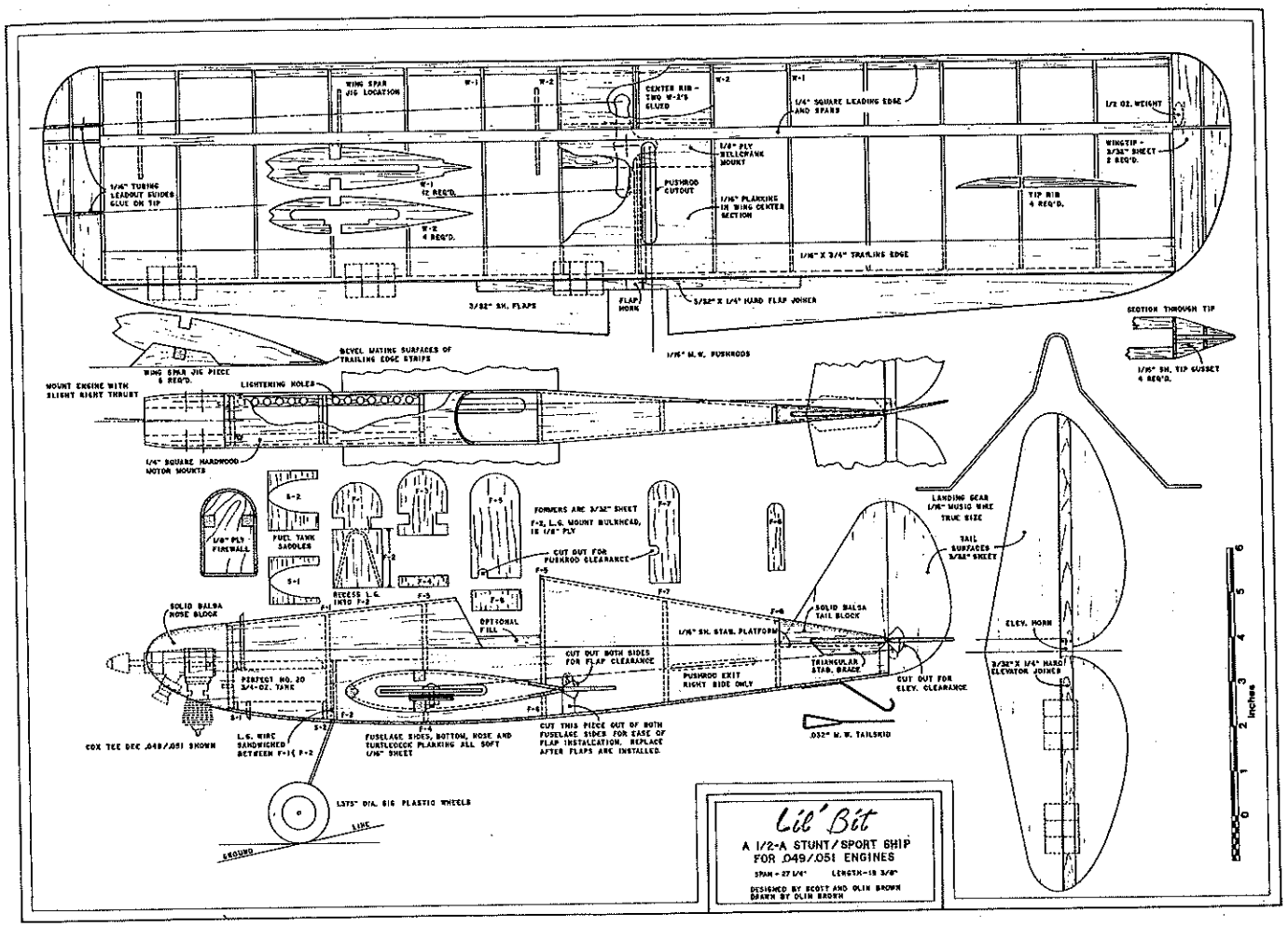
Cut two 1/16 brass tubing lead-out guides to length, slip them over the outboard ends of the lead-out lines, and glue them to the top of the left wing tip at the locations shown on the plan. Be careful not to slop glue on the lead-out lines themselves and accidentally glue them to the guides! The locations of the lead-out guides will produce enough flying line sweepback to keep Lil' Bit tight on the lines. Install the flying wire clips to the outboard ends of the lead-out wires, using the AMA rule book method. Make the two lead-out lines as near the same total length as possible.

Glue the tip ribs onto the top and bottom of the wing tips. The tip rib that goes on top of the left wing tip will need notches cut or sanded into its bottom edge to fit over the tubing lead-out guides. Cover the top and bottom of the wing center section with soft 1/16 sheet balsa, with the grain running spanwise. Cut out the pushrod clearance opening in the top sheeting with a sharp knife, and finish with sandpaper.

Sand the wing surfaces with 100-grit garnet paper on a long sanding block. We use a block made of a 30-in.-long, perfectly straight 1 x 2-in. hard pine. Garnet paper strips, 100 and 200 grit, are adhered to the narrow edges with aerosol contact cement, thus providing a double-sided sanding block. Hold the sanding block spanwise on the wing surface and work it carefully from LE to TE and back again, and also spanwise. The garnet paper cuts fast, so be very careful not to sand dips or flat spots into the edges of the ribs. Work slowly to achieve a smooth, continuously curving, symmetrical wing profile.

The fuselage is built of sheet parts which should be cut out in advance. Cut the firewall and landing gear mount bulkhead F-2 from 1/8-in. plywood. Drill a hole in the firewall for the fuel tank suction tube. All other formers are cut from 3/32 sheet balsa with the grain running vertically. Fuselage sides are cut from 1/16 sheet balsa with the grain running lengthwise.

When choosing wood and other materials for your model, pick out not only the straightest and flattest but also the lightest you can find, except for particular parts where you must sacrifice weight for strength. Saving weight wherever possible will definitely make a difference in flight performance.



Cut out the openings for the wing, the pushrod exit slot in the right fuselage side, and the small pieces from each side just below the flap joiner strip. Save these last two little pieces, as they'll be replaced after flap installation.

Cut the engine mounts from ¼-in.-sq. hardwood. We used hard pine, but any hardwood would be OK. Drill holes through the engine mounts to lighten them, as shown on the plans. Carve out the notch in the left-hand mount for clearance of the upper fuel tank vent tube.

Glue the engine mounts in place, aligning their top edges with the top edges of the fuselage sides. Remember, the two fuselage sides are different! Follow the plans carefully to make sure the mounts are glued in correctly. The mounts extend all the way back to former F-3 in order to transfer engine vibration to the whole airframe and thus help dampen the vibration.

Lay what will be the right fuselage side down on your board with the mount facing up, and glue the firewall and formers F-3 and F-5 (but not F-1) to it. Check the formers with a square or triangle to make sure they're glued perpendicularly to the side.

The fuel tank must be installed now, since the fuselage is literally built around it. We used a Perfect brand #20¾-oz. wedge-shaped stunt tank. This size tank carries enough fuel to get in some aerobatics, but it doesn't keep the engine running so long that you're ready to drop before it quits. You can, of course, use any tank narrow enough to fit in the fuselage. If you use the Perfect #20 and install it exactly per the plans, the fuel suction tube will be lined up with the fuel intake on the Cox Tee Dee .051, so you'll get decent engine run whether the model is upright or inverted.

The upper tank vent tube will have to be lengthened so that it will stick up out of the fuselage. We recommend adding a piece of the same size tubing with a sleeve of the next largest size tubing soldered or glued around the joint. Bevel the exposed ends of the tank vent tubes to the front, so that when the model is flying, the ram air effect will pressurize the tank and help fuel flow somewhat. We'll likely get arguments from some fliers about this, but it's a 30-year-old habit that's hard to break!

Scott's sister Sara is the other pilot in the family. Sara has been flying since she was in grade school and finds the Lil' Bit a great model to show off with. Astounds the boys!

To install the tank, first glue S-1 to the rear of the firewall, then glue S-2 to the lower portion of F-1 (remember that F-1 hasn't been installed yet). Now slide the forward end of the tank into place within S-1 and against the rear of the firewall, poking the fuel pickup tube through the hole in the firewall. Glue F-1 in position, sliding it up tight against the rear of the tank so that S-2 fits around the tank's rear end. You'll likely have to do a little filing, trimming, and sanding on both the tank and the saddles, since it's a tight fit.

After the tank is firmly in place, turn the fuselage side upside down so that it's resting vertically on its top edge with the formers sticking out to the side. Mark the position of the former on the remaining side, apply glue to the end of the former, and press the side (which is also turned upside down) into place against the formers. Pin the side to the ends of the formers until dry. Bevel the inside mating surfaces of the rear fuselage ends, and glue formers F-7 and F-8 into place. Finally, glue the rear fuselage ends together. Do not install formers F-4 and F-6 until after the wing is in place.

Continued on page 70

Power plant. The little Cox ½A engines are incredibly powerful for their size and weight. With suitable modifications to the fuselage nose, any of the Cox .049 engines could be used and would haul Lil' Bit around just fine. However, we just happened to have a Tee Dee .051 on hand and literally designed the airframe around it and the tank. We inverted the engine for appearance's sake, and it runs fine that way. The landing gear is far enough forward to keep the glow plug from scraping the ground in case of a nose-over—which, so far, hasn't happened.

With the fuselage lying upside down on your board, position the engine on the mounts. Turn it a little toward what will be the right side of the airframe for a little outthrust (which helps keep the plane tight on the lines), and mark the locations of the four holes on the mounts. (Important! Remember that the fuselage is upside down when you mark the bolt holes for engine offset.)

Drill holes in the mounts for 2-56 x ¾-in. bolts. Bolt the engine in place with the bolt heads up (when the plane is right-side-up), so that the nuts and washers will be below the engine mounts and won't poke through the nose block when it's rounded off. Install the fuel line from tank to engine, and plug the fuel tank vents with tape to keep out balsa dust. Also, wrap the engine with a piece of cloth to keep it clean.

Bend the landing gear from 1/16 music wire, using the true-size layout on the plan as a pattern, and then bend the gear legs forward as shown on the fuselage side view. Install the wheels on the axles, and secure them with setscrew wheel collars or washers epoxied onto the axle tips. The 1⅜-in. wheels are lightweight Sig hollow plastic ones.

Lay the upper portion of the landing gear on former F-2, and trace the outline onto it. Rout out a groove in F-2 so the gear can be recessed into it. Lay F-2 on your board with the groove up, then epoxy the gear into the groove, being sure the gear legs are angled upward so they'll be canted forward after installation. After the epoxy is set, glue F-2 into the fuselage against the back of F-1. Hold or clamp it in place while the glue sets.

Install the wing and flaps. Slide the wing through the fuselage, and center it so there's the same amount of wing sticking out each side of the fuselage. Square the wing to the fuselage—that is, make sure the wing leading edge is perpendicular to the fuselage when viewed from above. Hold your square or drafting triangle against the wing leading edge and the forward part of the fuselage to ensure a right angle. When you're satisfied that the wing is aligned, run a bead of glue inside and outside the fuselage at the wing-fuselage junction and where the bottoms of F-3 and F-5 contact the wing.

Cut out 18 fabric flap hinge strips the size shown on the plan, and glue them to the flap assembly. Also, glue the flap horn to the flap joiner strip. Slide the flap assembly into position against the wing trailing edge (be sure the control horn is sticking up), and glue the free hinge ends to the wing TE. Finish the wing installation by gluing the two cutout pieces back into the fuselage sides, and then gluing formers F-4 and F-6 into place.

Cut the flap and elevator pushrods from 1/16 music wire. Slide wire keepers on the pushrods, and bend right angles in the ends. Install the pushrods in the bellcrank and the flap horn, and snap the keepers into place. Wait until the elevator is installed to bend the elevator pushrod end. Installing the pushrods into the bellcrank is a bit tedious, but with needle-nose pliers and perseverance it can be done.

Sheet the upper fuselage sections with soft 1/16 sheet balsa. We cut stiff paper patterns to the size needed to cover the upper forward fuselage and turtledeck sections, and then transferred these patterns to sheet balsa. Cut the balsa a little oversize, since it's a lot easier to trim it to shape than to fill in gaps with putty. Also, cut a hole in the nose sheet for the upper fuel tank vent.

Install the sheet by gluing one edge to the upper edge of the fuselage side, soaking the sheet with water until pliable, applying glue to the formers, and then wrapping the sheet over the formers. Pin the sheet to the edges of the formers to hold it in position while drying. The bend in the sheet at the tail over the top of F-8 is pretty tight. To keep the sheeting from splitting, use a sharp blade to lightly score the top surface lengthwise in a few places where it wraps over F-8.

Cut out the nose and tail blocks from soft, solid balsa, and cut the 3/32-in.-wide slots in the tail block for the vertical and horizontal stabilizers. Hollow the underside of the nose block to clear the engine crankcase, then glue it in place. Cut out and install a triangular-shaped piece of sheet balsa between the rear fuselage sides to serve as a platform for attaching the stabilizer. Then glue the tail block in place on this platform, tight against the rear of F-8.

Fill in any cracks or gaps between the fuselage top sheets and blocks with wood filler, and sand the blocks to proper contour, fairing them into the fuselage. Continue to fill cracks with filler and sand as necessary to obtain a smooth surface.

The tail surfaces are cut from 3/32-in. sheet balsa. As with the flaps, glue the elevators to the joiner strip, and pin and weight the assembly to your board to dry. Glue the control horn to the joiner strip in the downward-pointing position shown. Cut out 12 fabric hinges, and attach them to the stabilizer as you did with the flaps.

Position the stabilizer, and glue it in place in the fuselage. Alignment is critical. Make sure that the stabilizer is installed parallel to the wing when viewed from the front and rear. Also, the elevator-stabilizer hinge line should be parallel to the wing when viewed from above. A good way to check this alignment is to measure the distance from the upper wing spar straight back to the outer tip of the stabilizer on each side of the plane, and ensure that one tip isn't cocked more forward than the other.

Glue a short length of triangular stock under each side of the stabilizer, adjoining the fuselage. This firmly ties the stabilizer to the fuselage and adds very little weight. Glue the vertical stabilizer in place, making sure that it is absolutely vertical. Check it with a square or triangle.

Sheet the bottom of the fuselage with sections of 1/16 balsa, with the grain running crosswise. Next, glue the rudder to the vertical stabilizer and to the rear of the fuselage. Angle it slightly to provide a little right offset. Bend the tail skid from .032 music wire, and epoxy it in place.

Any covering system is satisfactory, including the iron-on variety. We still prefer the silkspan-and-dope route. We brushed a coat of Sig fuel-proof clear dope onto the wing's leading and trailing edges and center planking and then sanded lightly with 400-grit wet-or-dry paper. We then covered the wing with lightweight silkspan with the grain running spanwise. Dope the silkspan only to the leading and trailing edges and the edges of the wing tips. Do not dope the silkspan to the ribs—if you do, the covering can't adequately move when it shrinks, and you'll end up with a sagging covering job.

After the dope dries, shrink the silkspan by spraying it lightly with water and allowing it to dry thoroughly. We then dry sanded the entire airframe with 400-grit wet-or-dry paper and applied three coats of Sig sanding sealer, sanding lightly between coats. We decided on a nostalgic color scheme of overall Sig Diana Cream with Stearman Red trim and black numerals. A couple finish coats of clear dope would really make it shine! We chose not to put a windshield or canopy on this model, but you certainly could. Apply your AMA license number to the upper right wing surface.

We flew Lil' Bit on Sullivan brand .012-in. x 35-ft. braided lines after we carefully checked all line, pushrod, and horn connections. One other procedure we go through is to drip our Cox fuel through a paper coffee filter to make sure it's super clean. Small engines, particularly the reed valve variety, are super-sensitive to trashy fuel.

On the first takeoff, Scott chose a full-up-elevator catapult shot. With the Tee Dee really wound up, swinging a Cox 6 x 4 plastic prop and an Ace RC 1-in. spinner, Lil' Bit literally jumped off the ground and headed up, up and away! The initial takeoff was pretty much a wingover, and there was a lot of dancing and prancing around out there in the circle until order was restored. Lil' Bit flies exceptionally well, though, and is capable of skipping through the whole pattern. We suggest that you place the pushrods in the least sensitive control horn positions until you get the feel of this hot little machine. We hope you find Lil' Bit as much fun as we have. Just remember to have fun, but *always fly safely and away from power lines*!

Bill of Materials

Sheet Balsa

Continued on page 174

ey, Hal Winters, Don Harbin, and Bert Dugan are certainly due thunderous words of thanks for their fine efforts. Additional thanks go to Ann Underwood for keeping up with the considerable paperwork of entering, judging, and scoring the contest, and to Stan Alexander for causing everything to run so smoothly.

As a parting note, in contrast to last year's contest during which scores were not posted, this year Cliff Tacie kept everyone instantaneously informed of the scoring progression with printouts from his desktop computer. That prompt service was much appreciated, Cliff, and added a heightened sense of awareness to each competitor's efforts.

Nats Ind. Duration/Kruse

Continued from page 62

min. mark at 20:40, it appeared that Belieff was the new winner of the Stout Indoor trophy. But, no! Young Don had gone for broke on his last flight, and his model touched the floor after a flight of 21:18 just scant minutes before the witching hour.

Not willing to let the coveted trophy escape, Dan Belieff wound quickly, but in his haste to launch damaged his ship. Hurried repairs were effected, and the ship was launched despite the damage. It was, of course, badly out of trim and went to the floor with many turns still on the motor. Young Don Slusarczyk had done it. As one pundit said upon strolling out of the auditorium, "That was really beyond Belieff, wasn't it?" Most within earshot hurried on out without reply.

Credit for another good Indoor Nats certainly goes to the contestants who put forth their best efforts, both in helping their fellow modelers and in competing against them. Richard and Melody Doig also deserve a large measure of thanks for their tireless efforts on behalf of Indoor fliers. As long as a well-run contest can be assured, as it most certainly can under the supervision of the Doigs, Indoor at the Nats will continue its rightful place of prominence.

Nats Outdoor Scale/Kruse

Continued from page 65

bunch of people flying airplanes. I must apologize for being so busy flying and attempting to take the needed photos for this report that I did not get all of your names. It is because of that failure that I hesitate to name anyone for fear of offending those I might miss—but you know who you are, and be assured that your work was most appreciated.

To John Guenther, Stan Alexander, and Ann Underwood who caused things to again run so smoothly, even in the midst of the one seemingly obligatory site change, my thanks on behalf of all contestants.

We all look forward to next year and the resumption of a full slate of Free Flight events, among which Free Flight Scale will still remain our favorite.

Lil' Bit/Browns

Continued from page 71

1—1/16 x 4 x 36 in., soft—fuselage top & bottom covering, ribs
1—1/16 x 3 x 36 in., soft—fuselage sides, ribs, jig pieces
1—3/32 x 3 x 36 in., soft—formers, flaps, tips, tail surfaces

Other Balsa
3—¼ x ¼ x 36 in., med.—wing LE, spars, stabi-

lizer braces
2—1/16 x 3/4 x 36-in., soft—wing TEs
1—3/4 x 1 1/4 x 4 1/2-in. soft block—nose & tail blocks

Other Wood
1—3/32 x 1/4 x 19-in. hardwood strip—flap & elevator joiners
1/8 plywood, approx. 1 1/4 x 7 1/2 in., firewall, landing gear bulkhead, bellcrank mount
1—1/4 x 1/4 x 13-in. hardwood—motor mounts

Other Materials
Plans
Building board
Straight pins
Wax paper
1—Cox Tee Dee .049 or .051 engine
1—propeller, 6 x 4, Cox plastic or Top Flite, Zinger wood
1—1-in. plastic spinner, Ace RC, Inc.
1—3/4-oz. wedge fuel tank, Perfect #20
1/16 x 4-in. brass tubing—tank vent extension, lead-out guides
2 1/2 in. small plastic flexible fuel line
1/16 x 28-in. music wire—pushrods, landing gear
.032 x 4-in. music wire—tailskid
1—2-in. bellcrank with mounting hardware, Perfect or comparable
36-in. length braided lead-out line, Perfect or comparable
1 pair—flying wire clips, Perfect, Du-Bro, or comparable
1 pair—1 3/4-in.-dia. plastic wheels, Sig or comparable
1 pair—1/16-in. wheel collars, Perfect, Du-Bro, or comparable
4—2-56 x 3/4-in. engine mounting bolts with locknuts
2—small control horns, Perfect or comparable—flaps, elevator
4—wire pushrod keepers for 1/16-in.-dia. music wire
48—3/8 x 3/4-in. or similar size fabric control surface hinges
Aliphatic resin glue, Franklin Tite Bond or comparable
Five-minute epoxy glue, Duro or comparable
Garnet paper, 100- and 200-grit, Norton or comparable
Wet-or-dry paper, 400-grit, 3M or comparable
1 sheet—lightweight silkspan
Fuel-proof dope—Sig clear; sanding sealer, Diana Cream and Stearman Red or comparable
1-in. numerals for AMA license number
1 set—.012-in.x 35-ft. braided steel flying wire, Sullivan or comparable
1—1/2A control handle, Sullivan or comparable
Cox Super Power Glow Fuel

The above parts and materials should be available at your local hobby shop. There's word on some streets that supplies for Control Line models aren't available anymore, but we've found that not to be true. We were able to secure everything we needed to build Lil' Bit and other models from Johnny Clemens' Hobby Counter in Dallas, and we know of other shops that stock and order Control Line supplies. So don't accept, "Gee—we can't get that anymore," because it's just not true. Control Line is alive

Sparrow Hawk/O'Dwyer

Continued from page 78

The Sparrow Hawk flies best on four strands of 3/16-in. rubber. Ten grams of FAI or Champion rubber will be 78 to 80 in. long. Wash off the powder that coats the rubber in soapy water. Use the following method for tying rubber that will never slip. Tie a single overhand knot as close to each end as possible. Laying the two ends adjacent to each other, tie another overhand knot of the two strands. Use liberal amounts

Continued on page 178