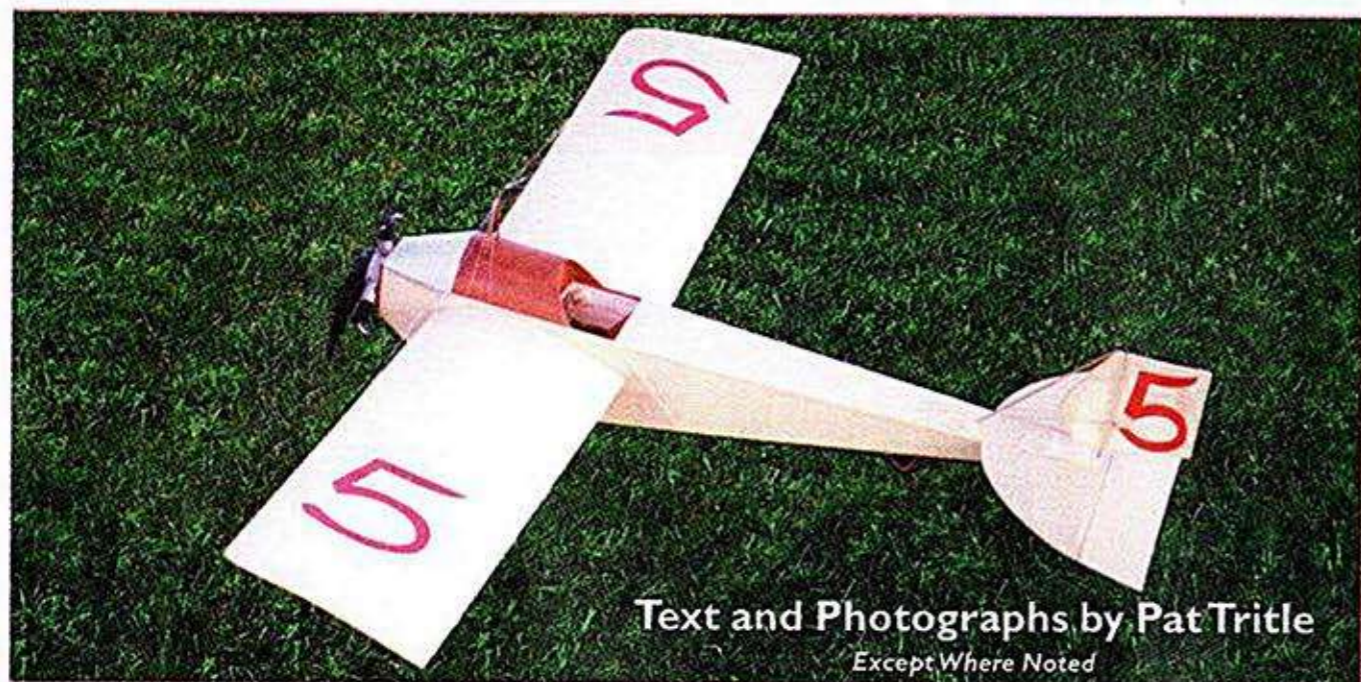


1913 EASTBOURNE



Text and Photographs by Pat Tritle

Except Where Noted

MONOPLANE

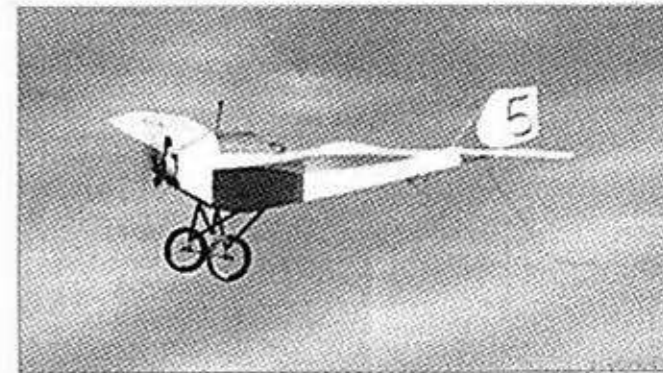


Using the new micro size R/C equipment and a geared Speed 400 motor, this little Sport Scale electric is a real performer, and is a "must have" for a special R/C treat.

I was taking my afternoon break at our local hobby shop and talking about what great new electric projects to do next, when somebody mentioned, "Those Magnificent Men and Their Flying Machines." Somebody else laughed and said it might be fun to race those old airplanes in the park, set up pylons and go for the most laps in three minutes, or the English channel crossing event. You know, over-fly a turkey roaster full of water carefully placed in the middle of the field, or ball diamond racing, standing at home plate flying around the bases. Shoot, we could even do Schneider cup re-enactment using a Slip n' Slide for



LEFT: Pat's Eastbourne in slow fly-by. Photo by Ralph Aguilar RIGHT: Eastbourne in high speed fly-by — rock solid! Pat's Model. Photo by Ralph Aguilar.



take-offs and landings — man, the possibilities are endless.

The more I thought about the basic idea, the better I liked it, so I went scrounging for something to do. A couple of evenings at the drawing board brought forth enough lines from which an airplane could be built. The first design was a toss up between the Eastbourne Monoplane and the Caudron Racer. The Eastbourne won out because it seemed a bit simpler to build. I had a few Speed 400 designs under my belt at the time, but these type airplanes were far less conventional than what I had been doing and figured that if I was going to design a "Goober," I really didn't want to spend any more time on it than absolutely necessary.

As it turned out, the Eastbourne Monoplane is anything but a "Goober." The flying characteristics are very stable and "groovy" with no tendency to swing the tail from side to side if the rudder input gets a little overly aggressive. The initial

test flights were done with the C.G. at 33% and has been tested as far aft as 39%. The airplane really likes the C.G. at 36%, which is just ahead of the point where one must exhibit extreme finesse, lest ye shall induce the dreaded snap roll! At 36%, the landing flair is smooth and predictable and still very docile.

As far as the racing part goes, if you have to go fast to race, this one is for you! This airplane has been clocked at speeds in excess of 14 mph (in tailwind) and lands at about half of that. Take-off can be accomplished either ROG or hand-launched, and average flight times are around six minutes at full throttle and as much as nine minutes at 60% power.

All-in-all, it is a fun little airplane to fly and doesn't possess any of the nasty characteristics that one would think a model like this would have. The real secret to

Sport Scale Electric For Geared Speed 400

1913 EASTBOURNE MONOPLANE

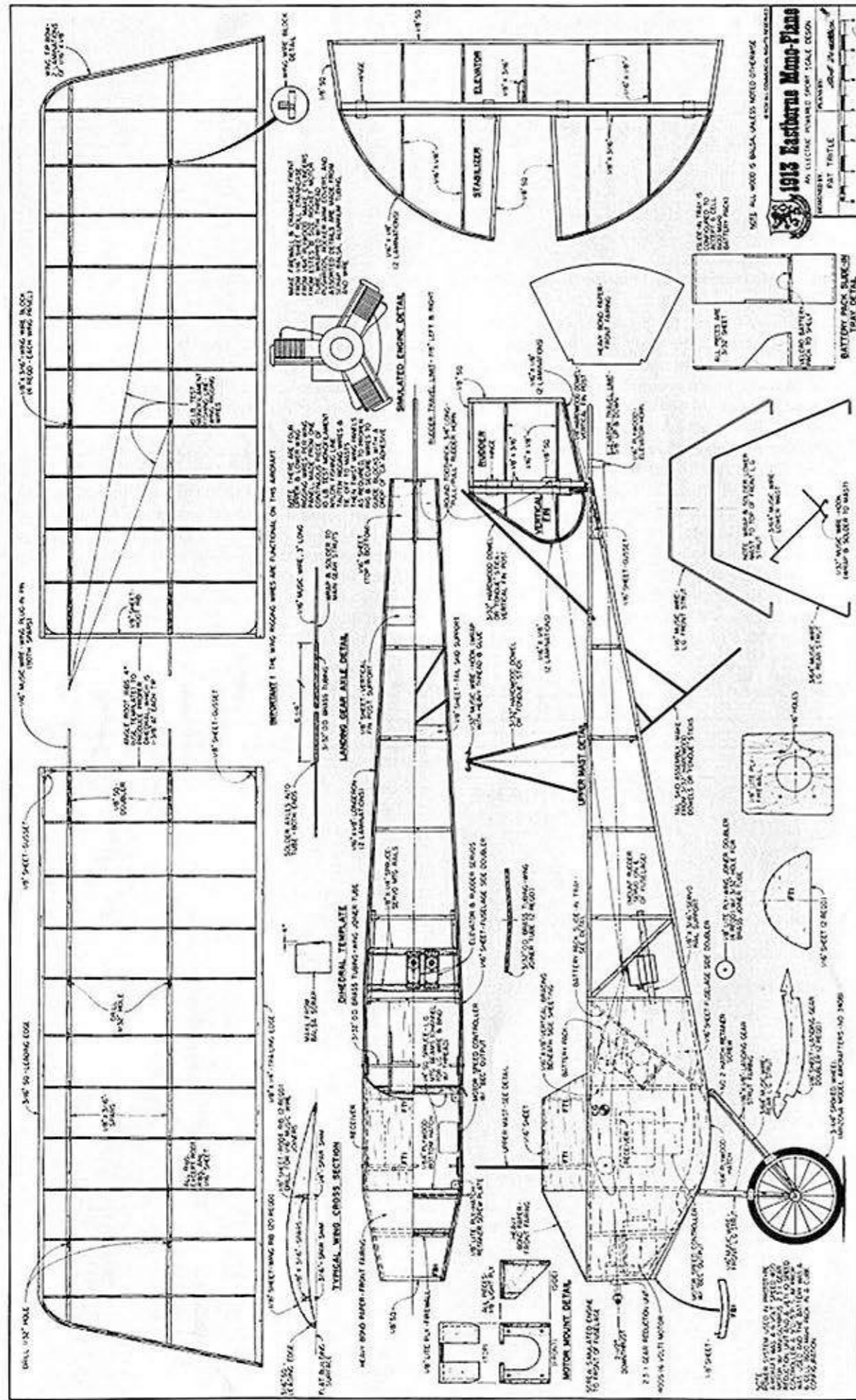
Designed by: Pat Tritle	VERTICAL FIN WIDTH (inc. rud.) 4-7/8 Inches
TYPE AIRCRAFT Sport Scale Electric	REC. MOTOR 6V Speed 400 w/2.33:1 Reduction
WINGSPAN 43-3/8 Inches	BATTERY SIZE 600 AE 6 Cell
WING CHORD 7-1/2 Inches	LANDING GEAR Conventional
TOTAL WING AREA 320 Sq. In.	REC. NO. OF CHANNELS 3
WING LOCATION Shoulder Wing	CONTROL FUNCTIONS Rud., Elev., Throt. C.G. (from L.E.) 2-13/16 Inches (36%)
AIRFOIL Undercamber	ELEVATOR THROWS 5/8" Up — 5/8" Down
WING PLANFORM Constant Chord	AILERON THROWS NA
DIHEDRAL, EACH TIP 1-3/8 Inches (4°)	RUDDER THROWS 7/8" Left — 7/8" Right
OVERALL FUSELAGE LENGTH 31 Inches	SIDETHRUST 0°
RADIO COMPARTMENT SIZE (L) 3-1/4" x (W) 3" x (H) 4"	DOWNTHRUST/UPTHRUST 2.5° Downthrust
STABILIZER SPAN 13 Inches	BASIC MATERIALS USED IN CONSTRUCTION Fuselage Balsa, Spruce, Lite Ply Wing Balsa Empennage Balsa
STABILIZER CHORD (inc. elev.) 6-3/4 Inches	Wt. Ready To Fly ... 18.6 Oz. (1 Lb. 2.6 Oz.)
STABILIZER AREA 65 Sq. In.	Wing Loading 8.4 Oz./Sq. Ft.
STAB AIRFOIL SECTION Flat Plate	
STABILIZER LOCATION Conventional	
VERTICAL FIN HEIGHT 3-7/8 Inches	

success in all of these Speed 400 designs is not as much in airfoils or set-ups, but in the light wing loading. The Eastbourne noodled out to a flying weight of 18.6 ounces and wing loading of 8.67 oz./sq. ft. Balsa selection was basically "off the shelf." Although I did select the best available aircraft grade wood. I didn't go as far as removing the receiver case, but hey — a half ounce is a half ounce.

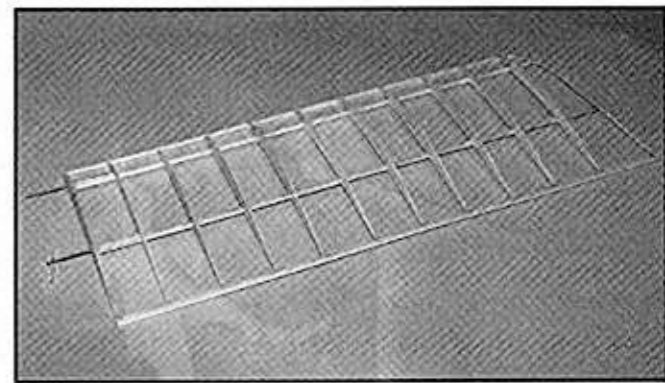
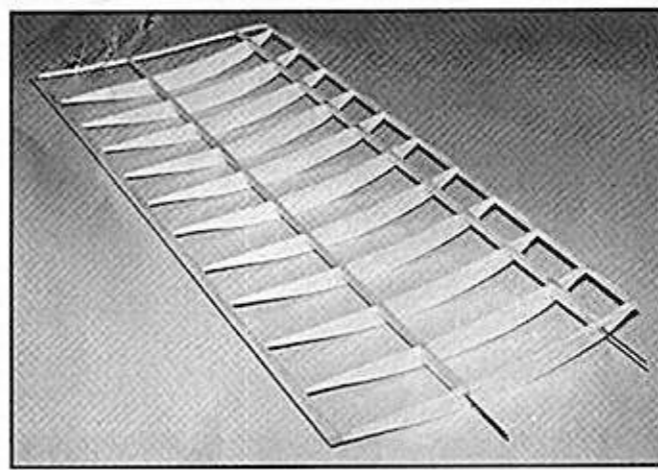
The Eastbourne was designed around two sheet wood sizes and three stick sizes. The firewall and motor mount are 1/8" lite ply. L.G. mount beams and servo rails are spruce and the lower hatch cover is 1/64" ply. Construction is very conventional with only one exception, the fuselage, so let's start there.



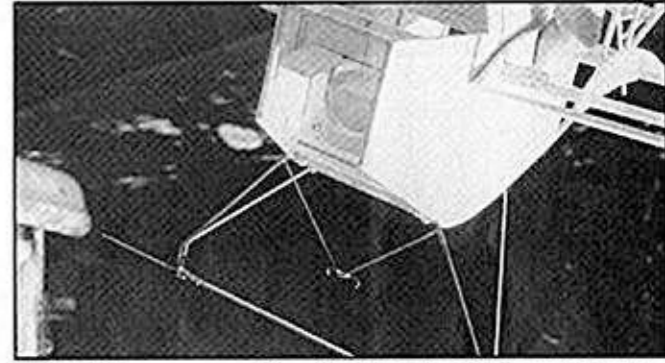
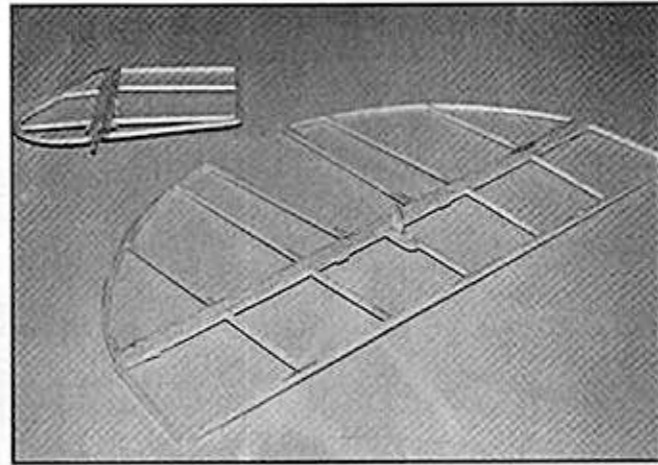
Two prototypes, one flyable; one in "bones." Finished model by Pat Tritle. Framed up model is by Ron Ginn.



PLAN NO. 1260



LEFT: Bottom wing shows the extreme undercamber and spar location with joiner pins in place. ABOVE: Top of wing. Note joiner pin retainer blocking.



LEFT: Tail group assemblies. Note location of plywood elevator horn. Hinges are small strips of Radio South CA hinges. Secure with RC-56 after covering. ABOVE: Wire landing gear assembly in place ready for balsa fairings. Note lower wing wire attach point on mast.

CONSTRUCTION

Fuselage

Start by making up the lower L.G. mounts and fuselage side sheets from light 1/16" balsa. Pin the L.G. mount over the fuselage side view followed by the 1/16" x 1/8" upper and lower longerons. Now fit and glue the 1/16" x 1/8" vertical and diagonal bracing from the aft edge of the sheeting forward and the 1/8" square verticals and diagonals aft. Next, fit and glue the front side sheeting in place followed by the 1/16" x 1/8" balsa longeron doublers aft of the side sheeting. Remove the fuselage side

from the plan and fit the 1/16" balsa filler at the aft end, flush with the outside edge.

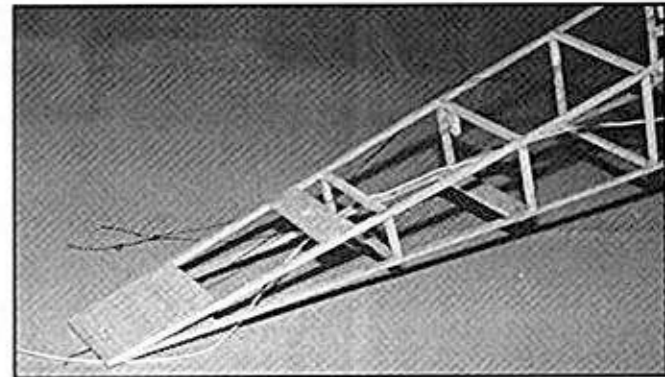
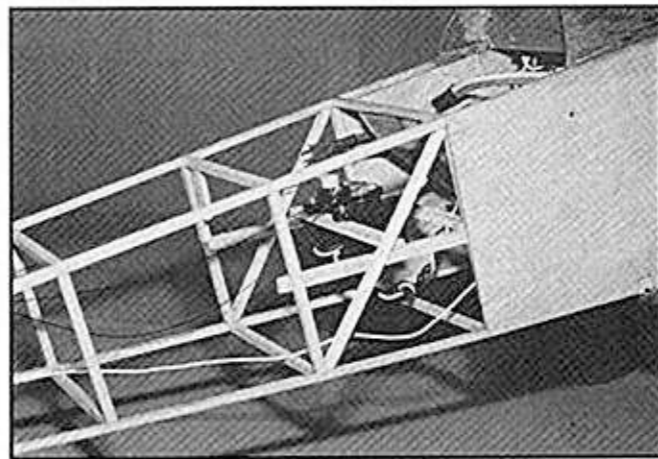
The R.H. fuselage side builds the same way, except you must first turn the plan over and rub it down with cooking oil to make it transparent, then build up the R.H. side as described above. Glue the 1/8" lite ply wing joiner doublers in place on both sides and stack drill for the wing joiner tubes.

With both sides complete, carefully sand away all the bumps and boo-boos. Now cut a set of fuselage crosspieces and the 1/4" square spruce L.G. blocks and

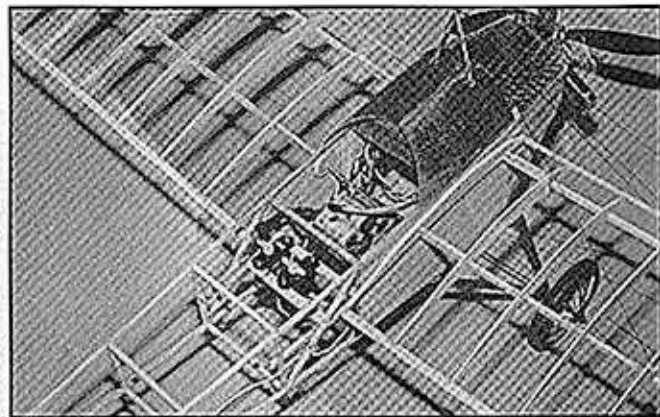
notch the spruce blocks to receive the wire landing gear. I made a tool from a piece of music wire with a dowel handle in several different sizes specifically for jobs just like this one.

Pin all the top crosspieces to the plan, make up the 1/8" balsa rudder support plate and 1/16" balsa aft sheet, and pin them to the plan. Now, align the fuselage sides over the plan upside down and glue them to the crosspieces. Glue the L.G. blocks in place followed by all the bottom crosspieces and support sheeting for the tail skid and the rear most sheeting.

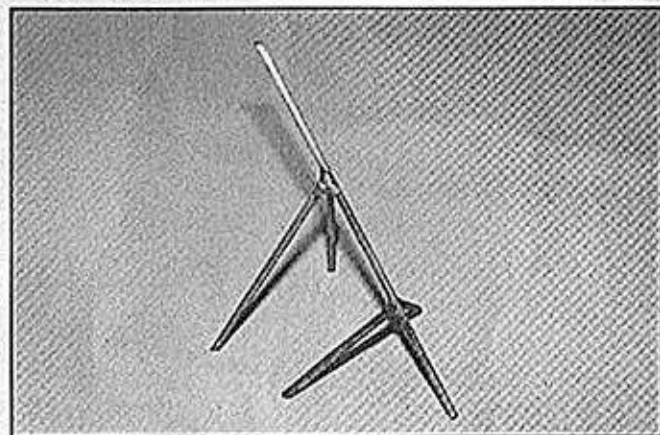
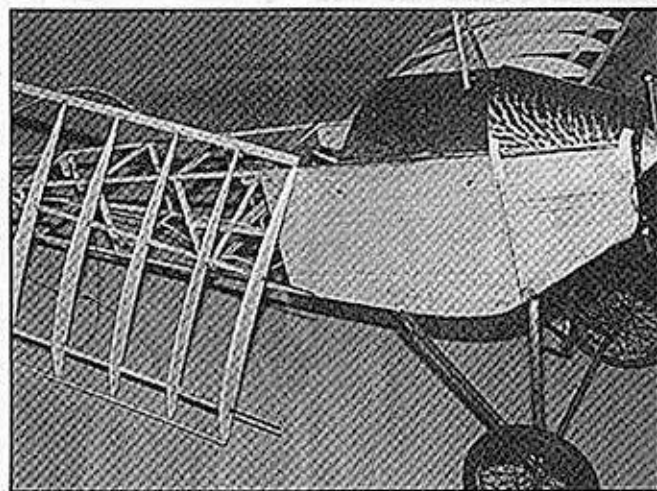
Unpin the fuselage assembly from



LEFT: Servo rails located aft of cockpit. Note rudder pull-pull cables. ABOVE: Elevator pushrod and antenna exit at rear of fuselage. Sheet balsa rudder mounting plates and wire rod guides.



LEFT: Frontal details include fake engine, turned aluminum upper cowl fairing, and upper king post from bamboo "fendu" sticks. ABOVE: Receiver and speed control tucked up under front sheeting. Battery is dropped into cockpit for quick easy installation. Two S-80 servos aft of cockpit.



LEFT: Wing joiner detail. Pins are 1/16" music wire, receivers are 3/32" o.d. brass tubes. ABOVE: Tail skid made from bamboo sticks.

the board and score the side sheeting at the front end. Carefully score and break the sides and add FB-1 and the top crosspiece. Add formers FT-1 and sheet the fuselage top.

Cut the firewall and glue in position, being very careful to maintain proper down thrust. Next, make up the mount and screw it to the firewall with four #2 SM screws.

The tail skid is made up from small bamboo fondue sticks, but don't glue it to the fuselage yet. The upper mast is also made from fondue sticks, fitted through the top fuselage sheeting and glued in place during final assembly.

Vertical and Horizontal Stab

Cut bowing patterns from artists' foam board (or your favorite bowing pattern stuff) and make up the rudder and stab outlines from 1/16" x 1/8" balsa. When dry, frame the parts as shown on the plan. Notch the hinge spars for CA hinges cut to 1/8" width, but don't glue them yet. Sand all the edges round and lay aside until later.

Wings

The wings are the easy part. Make a template and laminate the tip bows. Mark the spars for the second inner (root end) and the tip rib locations and glue those ribs in place and set this assembly over the plan. Note the spars are supported by the ribs. Now, locate and glue the remaining 1/16" ribs in place. Align the 1/8" root rib to the 4° dihedral angle and glue in place. Add the wing brace wire blocks, L.E., T.E., and tip bows to complete the assembly. If everything goes as planned when you pull the wing from the board, you will notice the T.E. curl up a little at the last couple of rib bays. Don't expend a lot of effort trying to undo the curl, as the built-in wash-out is part of the reason the Eastbourne turns so well. (The other reason she flies so well is that the airfoil was traced from a really good banana.) Build the second wing panel in the same fashion.

Landing Gear

Build the landing gear next by bending all the components from the

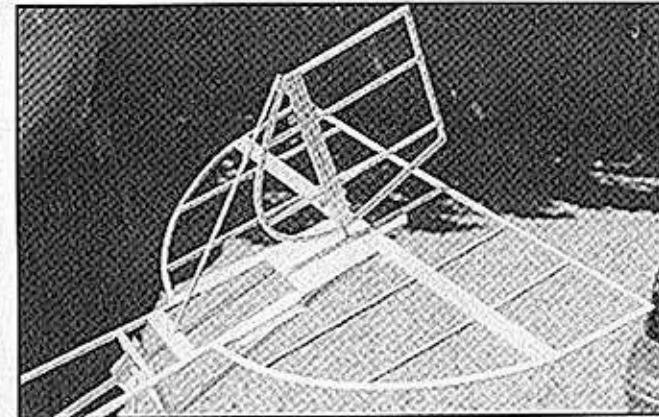
patterns and assemble the parts on the fuselage. Wrap the joints and solder once everything is properly aligned. Angle the lower rigging mast a little aft so the wing rigging cables will clear the forward gear strut.

Mounting the Wings

Bend the brass wing plug-in receiver tubes to shape and slip them into the predrilled holes in the fuselage, but don't glue them yet. Now cut the four 1/16" dia. M.W. pins to length and glue the front ones to the wing main spar as shown and block in place. Plug the rear pins into the fuselage and slip the wing onto the fuselage. Tack-glue the pins to the rear spar. Remove the wing and permanently attach the rear pin to the spar and block in as shown. Repeat the process for the other wing. Now plug both wings into the fuselage to ensure proper receiver tube alignment and tack the tubes in place. Remove the wings and permanently glue the tubes.

Installing the Radio

Glue the servo rails in place and space for your servo application. I



LEFT: Faired landing gear with hand laid spoked wheels. ABOVE: Tail group in place on fuselage.

would recommend the FMA S-80 sub micro servos, at just over 2/3 oz. per pair; you can't beat them. Velcro the receiver and speed control to the forward fuselage sides and run the small Gold-N-Rod tube down the fuselage and attach at least two places along the way. Make up the elevator pushrod from .020" dia. M.W. using "Z" bends at both ends. Finally, run the rudder pull cables from heavy sewing thread and note the exact location where they exit the fuselage and mark it on the plan. This way, you will know where to punch exit holes in the cover during final assembly.

Now that the model is basically complete, the motor/gear box can be installed, connected to the speed control and test-run. When I set mine up, I used Dean's four pin connectors wired red to B+ everywhere except at the motor which is red to B- since the gear drive reverses the prop rotation.

Configure your battery into two rows of three cells (I'm using 600 AE or 500 AR cells). Build the battery slip and use the pack for final positioning for clearance from the rear wing joiner tube.

Covering

You've probably noticed by now that the airframe is a tad bit delicate, so do your final sanding with some finesse. When satisfied, apply a coat of balsa lock to everything to which you intend to attach the cover. This would include the bottom of all the wing ribs to accommodate the undercamber.

I don't recommend any material heavier than Litespan on this model. I personally prefer Airspan since I use Japanese tissue for trim and apply two coats of dope anyway.

The prototype was covered with buff-colored Airspan to represent natural linen. The red 5's were doped

on with non-taughtening butyrate followed by two complete coats. By the way, if you wind up with a couple of puckers at the wingtips or crowfeet behind the cockpit, it is okay, as the real ones weren't all that flawless either. All the exposed wood was finished with stain and varnish.

Final Assembly

Glue the vertical fin and horizon stabilizer in place while keeping an eye out for proper alignment. Glue the hinges in place with RC-56 or equivalent and connect up with the control systems, being careful to maintain neutral control alignment. Use 3/32" o.d. aluminum tubes about 1/8" long to crimp the rudder cables at the servo arm. Route the cables out the back and wrap twice around the dowel control horn and secure with a drop of CA.

Plug the wings into the fuselage and rig them up using 10 lb. test monofilament fishing line. Each panel is rigged using one piece of line starting at the upper mast, again using 3/32" aluminum tubes about 1/8" long for crimps. Feed each line at the masts through the crimp so the whole bundle will be secure once the crimp is squeezed. Once the whole

panel is strung up carefully, pull the line good and taught. Feed the stub end back through the crimp and pinch it to secure the lines and add a drop of CA top and bottom. Do the other wing the same way.

Now that the rigging is in place, align the panels until they look nice and straight and put a drop of CA at all eight points where the lines pass through the wing panels.

Now go back and carefully double check all your joints as the rigging is purely functional and must be secure.

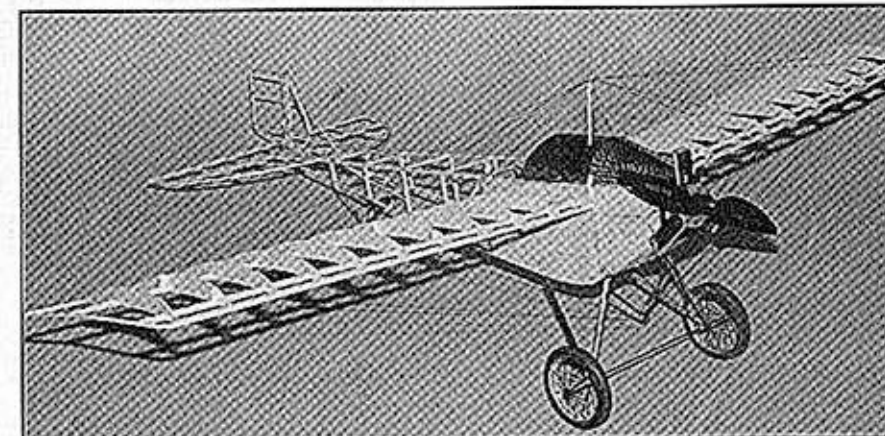
Final Details

The dummy engine is made up from bits of balsa and ply. The cylinders are from rocket tubes wrapped with thread to represent cooling fins. The rocker arms are scrap styrene plastic.

Cut the belly hatch from 1/64" ply and attach with #2 SM screws. The main gear is also attached with #2 screws. The tail skid is glued in place followed by the upper cowl which can be made from either bond paper painted silver or litho plate.

Wheels

The two flying prototypes were fitted with homemade spoked wheels built on a homemade jig. However,



In "full rig," ready to fly (less cover). Note: Flying wires are fully functional.

spoked wheel kits are available from Arizona Model Aircrafters and will work nicely.

Flying

First and foremost, balance the model as shown. If you come out a tad tail heavy, drop a bit of ballast into the top engine cylinder until the correct C.G. is achieved. If you opt to go to the conservative side, don't go to far forward, as the glide will resemble that of a large watermelon.

I prefer hand-launching on early flight testing. On a properly balanced airplane, the elevator should trim neutral. With a gentle toss at full throttle, the airplane will literally fly right out of your hand. Turns are very predictable and indicate no tendency to tuck into the roll. Do watch your speed in the down lines to prevent flutter. Mine never has, but every airframe does have its limitations.

All-in-all, the Eastbourne is a great flying airplane which should deliver many happy hours of pure flying fun. And, who knows, maybe ball diamond racing will catch on and be the first rage of the new millenium!

