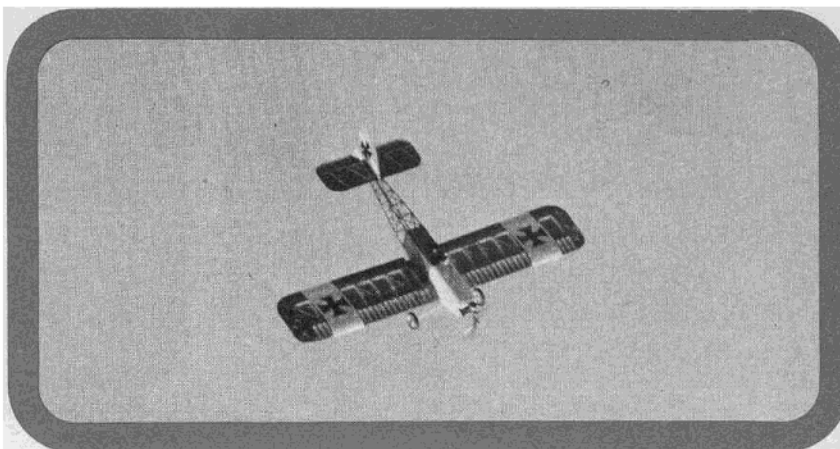


**A**erotique is a continuation of my design efforts to capture that special thrill of aviation when it was in its infancy. Let's face it, old airplanes excite me! Although not a scale airplane, the Aerotique looks old, flies slow and easy, and attracts lots of attention. Landing gear geometry is such that take-offs and landings can almost be made with your eyes shut. Because of the thick, high-lift airfoil and the light wing loading, it can be landed at a snails pace and never drop a wing!

But friends, we put the wing on the bottom for a reason! With lots of control throw and the Center of Gravity slightly to the rear of that shown on the plans, Aerotique lives up to its name. It is aerobatic! The roll rate is brisk, loops are tight, snaps and spins are instantaneous and inverted flight is a breeze.

If you like to putt around the pattern in slow flight like I do, Aerotique is for you! Or, if you are a real hot dog pilot like some of my friends, Aerotique is for you!

Just a word about construction, Aerotique, like her sister, Miss Vintage (RCM June 1976), is designed to look complicated. Yet, the construction is sound, fast building and economical. The fuselage is constructed of 1/8" Sig Lite Ply and Spruce. Tail surfaces are balsa and spruce



join the pin holes with a ballpoint pen and you are ready to cut out the part. The main advantage of this method is accuracy plus the plans stay intact for future building projects. Think **light** when you build. Your finished ship ready to fly, less fuel, should weigh in at 4 to 4½ lbs.

#### Construction

##### Wing:

- Cut four pieces of trailing edge sheeting from 1/16" balsa 1½" x 24".
- Cut two 1/4" square medium balsa leading edge pieces 24" long.
- Cut four main spars from 1/4" square medium balsa 24" long.

as follows: Pin down the lower trailing edge sheet and glue the 3/16" square rear spar in place. Glue in four R-1 ribs. Sandwich the two 1/4" square main spars between the main dihedral braces and, when the glue has set, butt the main dihedral brace against the front of the R-1 ribs and glue in place. Add the four R-1A ribs and the 1/4" square leading edge. Again bevel the 3/16" square rear spar like you did on the main panels. Notch out rear of R-1 ribs to accept the 3/16" plywood rear dihedral brace and glue in place. Add the 1" x 1" x 1" balsa block which will be used to anchor the wing hold-down dowel. Also notch the bottom of

# AEROTIQUE

*If old airplanes excite you, then this Aerotique should be your airplane. It's aerobatic and can be set up for slow and easy flying or for the hotdog pilot. By George F. Jennings*

and the flat bottom airfoil balsa wing can easily be built on any flat surface. In case you are doubtful about strength of this type of construction, I pranged one in from about 100 feet up. It was at full power and straight in to frozen ground! Only one wing tip was damaged and the tail broke loose. The problem was radio failure so the radio was already broken! If you decide to build this aerobatic oldie, stick with a .25 or .35 engine. Aerotique was designed to fly — like in "airplane" — and not be guided — like in "missile"!

Before beginning, try to secure all materials needed for the job as this will save you time in the long run. Spruce and Lite-Ply can be purchased directly from Sig Manufacturing Co. in Montezuma, Iowa, if you can't find them locally. During construction, time can be saved by using one of the new generation of instant glues such as Carl Goldberg's Super Jet. Use 5-minute epoxy in high stress areas as called for in the building instructions. Parts can be transferred from your plan to the wood by putting the wood under the part outline on your plan and perforating the outline with a pin about every 1/8". Remove the wood,

Make all ribs from 3/32" balsa sheet. You will need: (16) R-2's; (28) R-2A's; (8) R-1's; (2) R-1AA's; and (8) R-1A's. Stack up the rib blanks and hold them together with straight pins. Mark the outline with a ballpoint pen and saw out on a bandsaw. Sand lightly to remove the balsa fuzz.

To build the left hand panel, pin down the 1/4" square main spar over your waxpaper covered plan on the building board. Also pin down the bottom 1/16" trailing edge sheet.

Glue the 3/16" square balsa rear spar on the trailing edge of the wing.

Glue all eight R-2 ribs in place.  
 Glue the 1/4" square leading edge in place.

Add the top 1/4" square main spar.  
 Glue in all R-2A half ribs.

Bevel the 3/16" rear spar to match R-2 ribs but leave off the top 1/16" trailing edge sheeting for now.

Repeat the last 7 steps and build the right hand wing panel.

Next cut three dihedral braces, the two main spars from 1/16" aircraft plywood and the rear brace from 3/16" plywood.

Build the center section over the plan

the ribs forward of the spar 1/8" deep to accept the 1/8" x 1" x 3½" plywood landing gear mount.

Pin the center section flat to your building board. Trial fit the wing panels in place. Block up each wing panel so that you have 1" dihedral under each tip when measured from the surface of the building board to the bottom of the main spar at the outboard end of each wing panel.

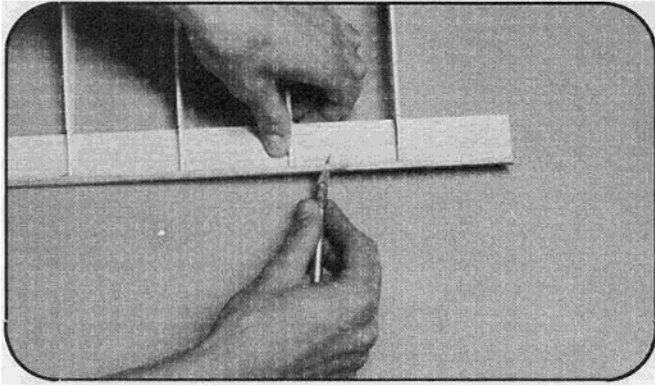
Join the wing panels by gluing, pinning, and clamping the dihedral braces securely to the spars. Make sure the glue is thoroughly dry before removing.

Add the remaining R-1 and R-1AA ribs.

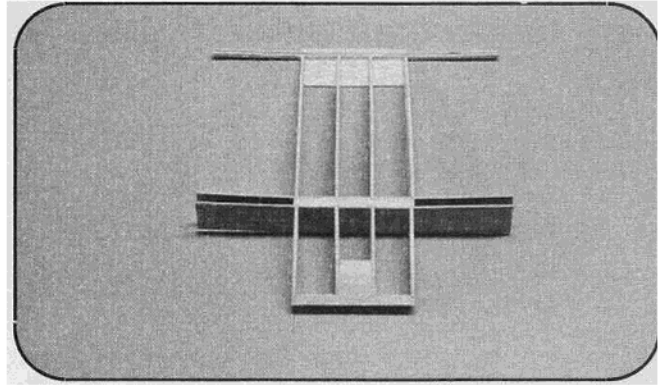
Pin the left panel flat to your building board and add the top 1/16" trailing edge sheet.

Add the 1/16" balsa vertical grain webbing behind the main spar.

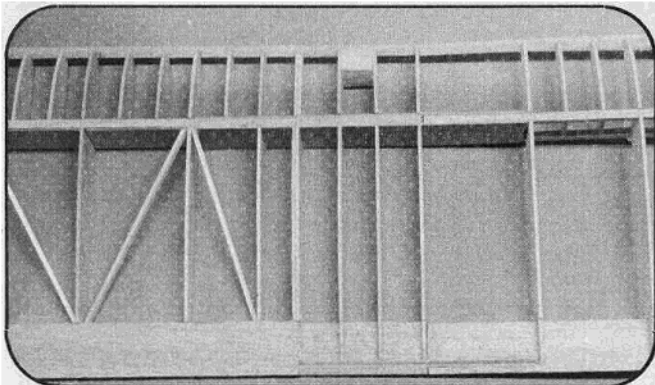
Add the trailing edge 1/16" balsa vertical grain webbing, only this time insert between the top and bottom of the trailing edge sheeting. **Caution** — Do not eliminate the webbing, as the wing gains much of its strength from it.



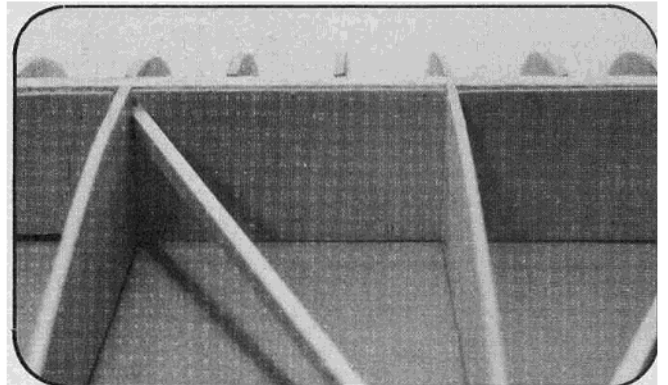
*Taper 3/16" square trailing edge to match rear of ribs.*



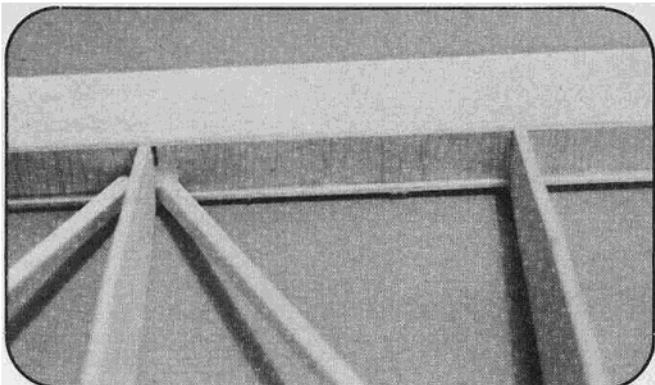
*Center section shown completed and ready to accept outboard wing panels.*



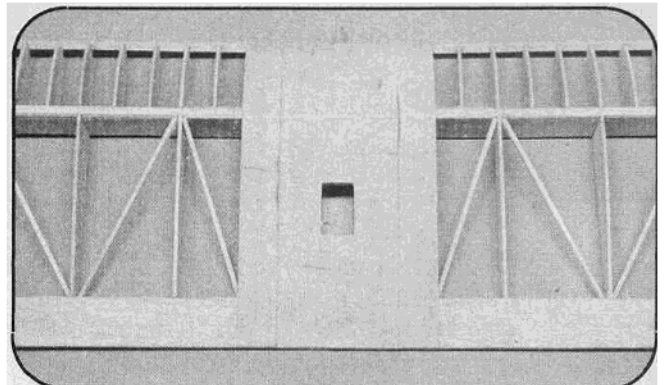
*Wing panels shown joined to center section. The top 1/16" trailing edge sheet is in place as well as the extra ribs on the left panel.*



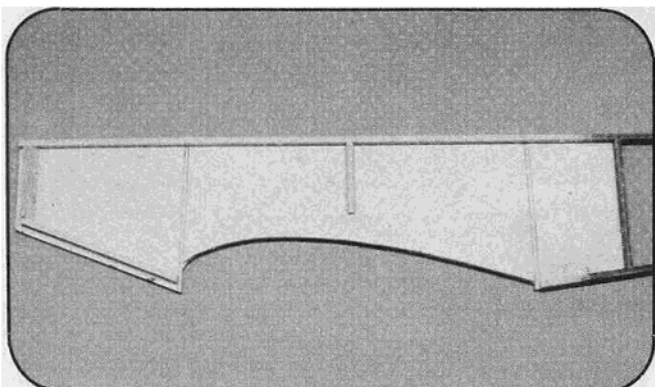
*Webbing for main spars is 1/16" vertical grain balsa butted against rear of main spars. Diagonal braces are 1/8" x 3/16" spruce.*



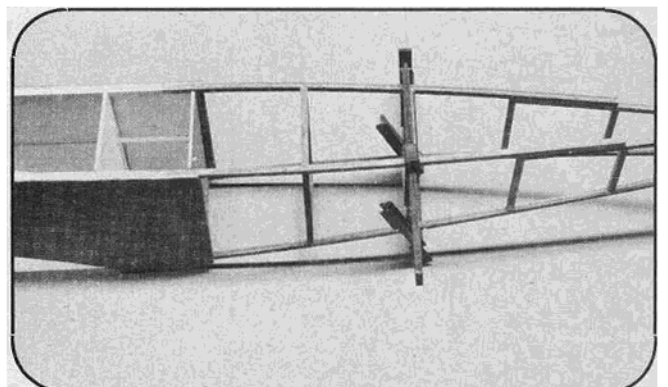
*Webbing for trailing edge is 1/16" vertical grain balsa inserted between top and bottom trailing edge sheeting.*



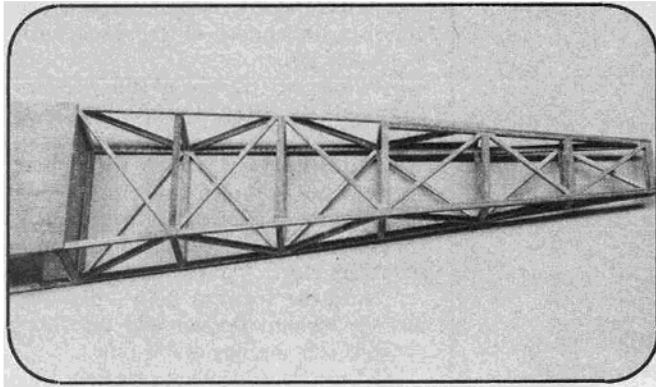
*Finished wing with 1/32" plywood center section covering in place and aileron servo hole cut. Photo shows ply overlapping T.E.*



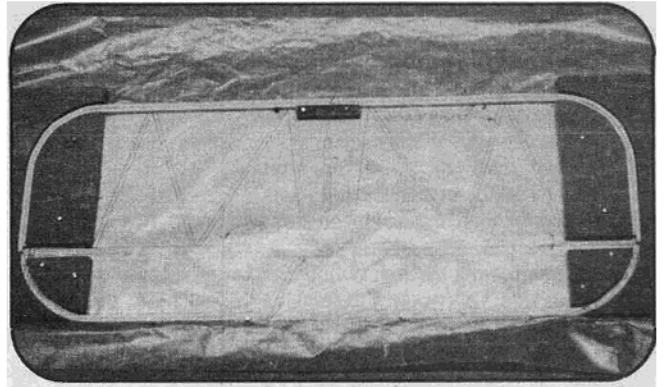
*Right fuselage side is built directly over the plan.*



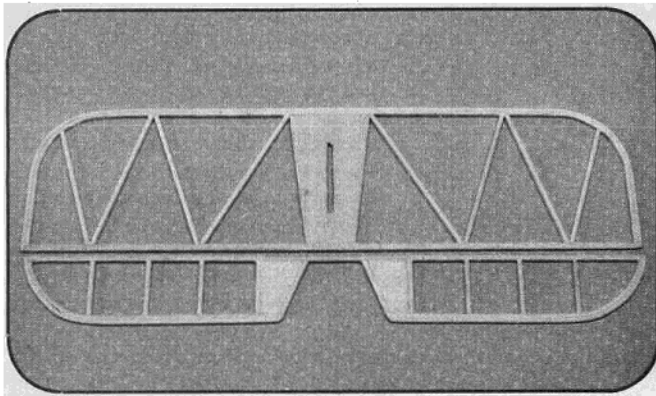
*Fuselage sides joined and 3/16" square spruce cross members being installed.*



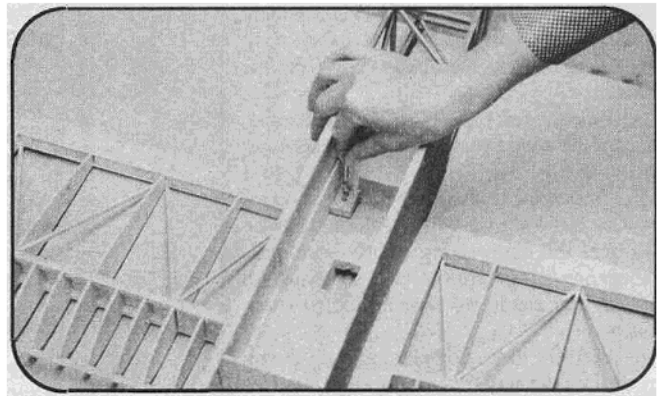
*Fuselage with 1/8" x 3/16" spruce diagonal braces in place.*



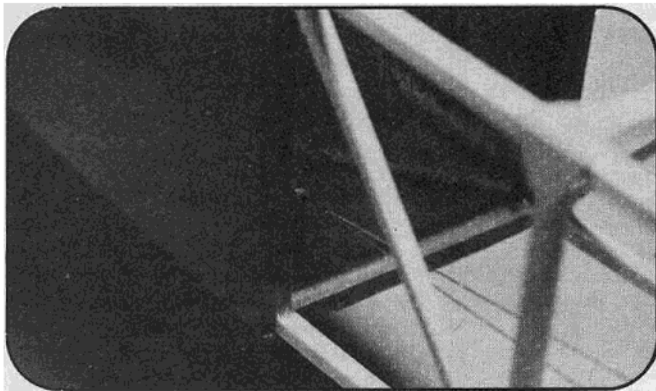
*Plywood jig used to form the double pieces of 1/8" x 3/16" spruce in the stab, elevator, fin and rudder.*



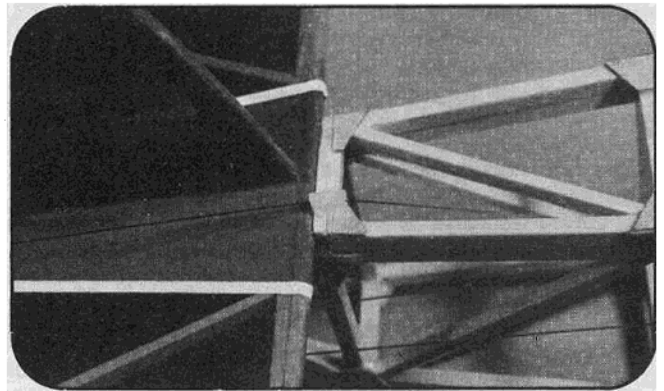
*Completed stab and elevator.*



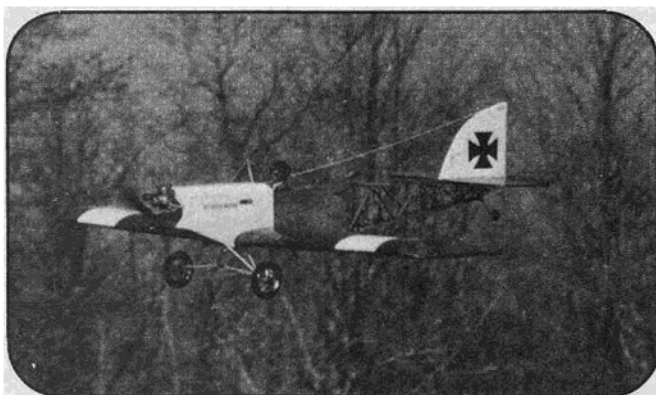
*An easy method of marking the spots for drilling the 1/4" holes for the nylon 1/4 x 20 wing hold-down screws.*



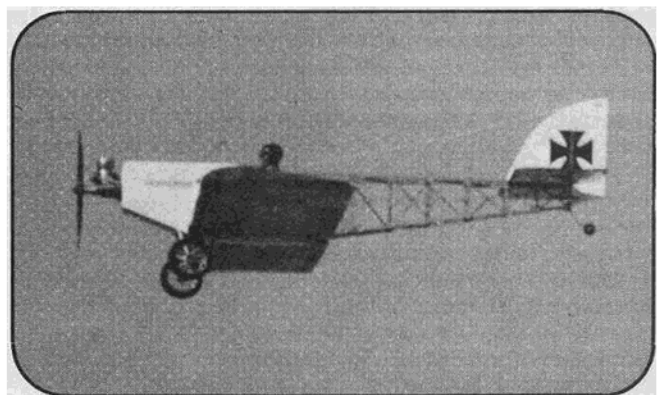
*Control cables shown exiting the fuselage. Note that both cables exit through the same piece of Inner Gold'N-Rod.*



*Small pieces of inner Gold'N-Rod are used to route the control cable through the open structure of the fuselage.*



*Flair out just before touch-down.*



*A slow fly-by.*

Add the 1/8" x 3/16" spruce diagonal braces between the ribs as shown on the plans.

When the left panel is thoroughly dry, repeat the previous 4 steps and complete the right panel.

Next add two 1/4" x 3/8" soft pine servo mounts to the center section. Space these to accommodate the servo you plan to use.

Cover the center section, both top and bottom with 1/32" plywood. Cut the 1/32" plywood by scoring with a sharp model knife.

Add the 1/8" wide strips of 1/32" plywood to the top and bottom to the main wing panels next to the center section.

Cut out the hole for the aileron servo.

Add the wing tips and tip braces which are cut from soft 1/4" sheet balsa. Cut lightening holes in the tips as shown on the plan.

Add the soft balsa blocks at the leading edge of the wing tip and shape to the contour of the airfoil.

Round the leading edge of the wing as well as the wing tip with a sanding block. Go over the entire wing lightly with fine sandpaper using extreme care so as not to destroy the airfoil by sanding the ribs too much.

Add the 1/4" dowel wing hold-down by drilling through the leading edge into the 1" x 1" x 1" balsa block and gluing in place.

Make strip ailerons from 1/4" sheet medium balsa, 1/4" wide, and simply round off both the front and rear edges. Hinge them temporarily and install the strip aileron horns. Do not permanently install until the wing is covered.

#### Fuselage:

Cut two fuselage sides from 1/8" Sig Lite Ply.

Cut F-1 from 3/16" aircraft plywood and install 4-40 blind nuts for the radial engine mount.

Cut out F-2 from 1/8" aircraft plywood and F-3 from 1/8" Sig Lite Ply.

Cut out F-4 from 1/8" balsa.

Place the right hand fuselage side over the plan and glue in the 3/16" square spruce brace as well as the 3/8" triangular balsa firewall brace and the 3/16" square spruce longerons. Add the vertical 3/16" square spruce braces to the open tail structure.

Build the left hand fuselage side directly over the right hand side so that they are matched. Place waxpaper between them so they don't stick together.

Pin down the completed right side and glue F-1, F-2, F-3, and F-4 in place with 5-minute epoxy. Use a 90° triangle to be sure that the formers are true.

Epoxy the left side in place making sure everything is straight and true.

Bevel the fuselage sides at the rear of the fuselage where they join with a sanding block.

Set the fuselage upside down over the plan and weight down with a brick or other heavy weight so it can't move. Draw the tail together so that the tailpost lines up directly

over the plan in perfect alignment. Glue and clamp with spring clothespins until thoroughly dry.

While the fuselage is still weighted down, add the 3/16" square spruce cross pieces.

Add the 1/8" x 3/16" diagonal spruce braces as shown on the plan.

Cut the gusset plates from 1/32" plywood scrap and glue in place with Super Jet instant glue.

Add the forward 3/16" plywood fuselage bottom. **Do not add the 1/32" plywood rear sheeting at this time.**

Construct the landing gear from 1/8" music wire. The 1/16" music wire shock absorber crossbar is functional so don't delete it! Wrap the joints with copper wire and solder with low temperature silver solder.

Epoxy the hardwood 1/4" x 20 nut blocks in place on the fuselage as shown on the plans.

Trial fit the wing in place. Make sure the wing is aligned perfectly. Insert a drill bit that just fits inside the threaded nut block hole through the hole and twist with your fingers to make a mark on the wing surface. Now drill the 1/4" holes through the wing and insert the 1/4" x 20 nylon bolts.

Trial fit the landing gear in place making sure placement is exactly at the position shown on the plans. Secure with 1/8" nylon landing gear clips and wood screws. The front two clips screw into the fuselage bottom and the back two screw into the plywood landing gear mount you installed in the bottom of the wing. When you remove the wing the two back clips must be loosened and two wood screws removed to detach the landing gear from the wing.

Add the top and bottom 1/32" ply sheeting to the fuselage as shown on the plans.

Tack glue the 3/4" soft balsa top hatch block in place and carve and sand to shape. Cut in two with a razor saw on the joint directly above former F-2. Permanently glue the rear portion to the cockpit area. The front portion serves as an access hatch to the fuel tank and battery.

The hatch may be attached with short lengths of 1/8" hardwood dowel at the rear, and plywood tabs and 4-40 blind nuts and bolts at the front.

Install lengths of inner Gold-N'-rod tubing between F-3 and F-4 as shown on the plan. These serve as a guide through which the control cables are run.

#### Tail Surfaces:

Using scrap plywood, make jigs to form the laminated spruce for the elevator, stabilizer, rudder and fin.

Lay down the plan and cover with waxpaper. Next tack the jigs in place over the plan.

Soak strips of 1/8" x 3/16" spruce in warm water until they become very pliable.

Bend the double strips of wet spruce around the jigs and hold in place with small blocks of wood. **Do not add glue at this time!**

## AEROTIQUE

Designed By: George F. Jennings

### TYPE AIRCRAFT

Vintage Sport

### WINGSPAN

57 1/2 Inches

### WING CHORD

11-5/16"

### TOTAL WING AREA

642 Sq. In.

### WING LOCATION

Low Wing

### AIRFOIL

Flat Bottom

### WING PLANFORM

Constant Chord

### DIHEDRAL EACH TIP

1 Inch

### O.A. FUSELAGE LENGTH

35 Inches

### RADIO COMPARTMENT AREA

(L)10" x (W)3 1/4" x (H)3 1/4"

### STABILIZER SPAN

19 Inches

### STABILIZER CHORD (incl. elev.)

7 1/4 Inches

### STABILIZER AREA

138 Sq. In.

### STAB. AIRFOIL SECTION

Flat

### STABILIZER LOCATION

Top of Fuselage

### VERTICAL FIN HEIGHT

7 Inches

### VERTICAL FIN WIDTH (incl. rudder)

7 3/4 Inches

### REC. ENGINE SIZE

.25-.35 Cu. In.

### FUEL TANK SIZE

6-8 Oz.

### LANDING GEAR

Conventional

### REC. NO. OF CHANNELS

4

### CONTROL FUNCTIONS

Rud., Elev., Throt, Ail.

### BASIC MATERIALS USED IN CONSTRUCTION

Fuselage ..... Balsa, Ply & Sig Lite

Wing ..... Balsa, Ply and Spruce

Empennage ..... Balsa and Spruce

Wt. Ready To Fly ..... 64-72 Oz.

Wing Loading ..... 14-16 Oz/Sq. Ft.

When dry remove the pieces from the jig and they will retain their shape. Now add yellow glue and laminate the two strips together and place back in the jig until thoroughly dry.

When the lamination is dry, remove the jig from your plan and build the empennage in a conventional manner using the necessary balsa and spruce as shown on the plan.

When everything is thoroughly dry, sand all tail surfaces and round the edges of the surfaces. Temporarily hinge the tail surfaces, however, the tail surfaces should be covered before the stab and fin are installed on the fuselage and permanently hinged.

#### **Finishing:**

Cover the wing and tail with your favorite covering material. A transparent finish gives a nice effect or you can get a more realistic vintage finish by using Super Coverite.

After covering, install the 3/32" plywood control horns as shown on the plan. Make a slot in the control surface and slip the horn in place and epoxy securely. The control horns as well as the open structure of the fuselage should be finished as natural wood. If you like, you can stain this to suit your taste.

Permanently install ailerons and horns.

Glue the stab and fin in place on the fuselage making sure they are aligned properly.

The forward fuselage can be finished in any conventional manner. On this prototype, the rear of this was finished with stain and the front was given two coats of surfacing resin, sanding after each coat. A spray coat of Superpoxy white paint was then applied. Be sure to protect the portions you have left natural wood by giving them a brush or spray coat of polyurethane clear or satin varnish.

Add the 3/16" dowel tripod on the front of the cockpit and finish to match the rear of the fuselage.

Install a dummy pilot.

Flying wires are non-functional and are simply for appearance but add to the realism. Use control cable or elastic cord.

Add a tail skid or a steerable tail wheel if you prefer.

Attach the wing, main landing gear, wheels, engine, muffler, gas tank and hatch.

Stand back and admire your work and make airplane noises!

#### **Radio Installation:**

Mount the aileron servo in the wing. Hook up the ailerons to the servo with 1/16" wire clevis and rods.

Trial fit the battery under the fuel tank and the receiver and the servos in the main compartment. Install the wing and shift the servos forward or back until the correct balance is achieved as shown on the plans. To correctly balance, turn the plane upside down and suspend the plane on your two

index fingers directly next to the fuselage at the balance point shown on the plans. When properly balanced the plane hangs slightly nose down.

When the position of the radio is found for correct balance, epoxy two pieces of 1/4" x 3/8" square soft pine across the fuselage to support the servo tray.

Wrap the battery and receiver loosely in foam and place in a plastic bag for fuel proofing. String the antenna wire to the tail. Install the receiver switch.

Use nylon covered braided steel wire fishing leader for control cables. Use at least 20 lb. test. **Do not** use monofilament fishing line because it will stretch with use. Measure and cut four lengths of control cable several inches longer than needed, running from the control horns to the servos. Attach a clevis to each of the four lengths. See detail on plan sheet.

Attach clevises to the control horns and, by trial and error, thread the cable through the open part of the fuselage and on through the Sullivan inner rod guides that were installed earlier. Both control cables from the elevator are run through one guide and the two from the rudder are run through the other. Because the guides are nylon and the cable is nylon-covered, there is very little friction and no wear. You will need to epoxy several small pieces of Sullivan inner rod approximately 3/16" long to the open framework back near the tail to serve as guides and keep the cable from rubbing on the framework.

Attach the control cable to the servo arms in the following manner: Take four pieces of 2" long 1/16" diameter music wire and bend the end of each into a tight loop or hook. The control cables attach to the wire loops or hooks by making a small loop and then applying a standard crimping sleeve. Du-Bro EZ connectors are then attached to the servo arms and the cable connectors are slid into the Du-Bro connectors. This makes a system with easily adjustable control surfaces.

Use 1/32" music wire, nyrod, or a Du-Bro throttle cable, for the throttle pushrod. Adjust the linkage accurately so that the servo throw matches the throttle throw.

For your initial flights control throw should be set as follows: rudder 3/4" each direction; elevator 5/8" each direction; and ailerons 3/16" each direction.

Double check your balance point and you are ready to go to the flying field!

#### **Flying:**

Check your radio installation one more time. Be sure you have adequate radio range. You did balance your propeller, didn't you? Do the controls work properly and move in the right direction? Remember the aileron that drops is on the wing that lifts. I remember a certain scale model of a Cessna Skylane I once built that had the ailerons hooked up backwards. All of the club members present were very impressed with my gutsy approach to a first test flight

which included an aileron roll on take-off. The immediate inverted landing at full throttle, however, sent them back to their own pursuits muttering about how dumb that was. I was one embarrassed test pilot.

Fire up your engine and taxi into position. Check the controls one more time and then slowly advance the throttle. Hold the elevator in neutral and in about 5 ft. the tail will come up all by itself. You may have to slightly nudge the rudder to the right to get a straight run into the wind. At about 20 ft. out, ease back on the stick and you're airborne. Gain some altitude before trying anything fancy. Aerotique has no nasty habits so just relax and enjoy the flight.

Landing is a piece of cake! Throttle back to about 1/2 throttle on the downwind leg and reduce to 1/4 throttle on the base leg just before turning on to final. Allow her to come on in and when you have made the field put the throttle to idle. Remember, your elevator controls your speed and your throttle controls your rate of descent. Many R/C flyers get this mixed up and try to stretch the glide with up elevator which kills the airspeed and eventually the airplane! (It stalls and falls.) Anyway, getting back to the landing, when you are ready to touch down, slowly bleed off your airspeed with a gradual increase in up elevator and start your flair when you are several inches above the ground. Keep feeding in up elevator by the time your wheels touch you should be holding full up elevator. After touch down, ease off the up elevator, steer her through the roll out with rudder. Sounds easy and it is once you get the hang of it.

Aerotique is so much fun to fly that you probably won't ever want to land. I thoroughly enjoy just putting around the sky at about 30 ft. altitude and at 1/3 throttle. This ship will really fly slowly and a favorite past time is to throttle back into a stiff wind (there is always a stiff wind in Michigan) and fly backwards across the field. I am planning to try a Saito .30 4 cycle on my next Aerotique. It should be a real show stopper!

Good luck with your Aerotique and I hope you have as much fun with yours as I have had with mine!

**From  
RCModeler  
Apr. 1981**