



**For some great water flying, try this Stand-Off Scale model of a late thirties French navel reconnaissance flying boat. It will create a lot of attention for you.**

**By Pavel Bosak**

**I**n 1937, the French Ministry of Aeronautics ordered a new navel reconnaissance aircraft to be used for coastal patrolling duties. The Breguet factory was commissioned to design this aircraft. Their proposed design was designated as the Breguet Bre 790 Nautilus. It was an all metal structure, high wing, flying boat, with wing and elevator surfaces being fabric covered. The entire trailing edge surfaces of the wing were utilized for the flaps and ailerons. Each wing was equipped with an outrigger support float. The Nautilus was designed to accommodate a three man crew, with the pilot and observer housed in a



# Breguet BRE 790 Nautilus

spacious, glassed canopy enclosure that afforded excellent visibility. The third crew member, a gunner, was positioned in an open cockpit just aft of the pylon mounted pusher engine. The rear facing gunner was armed with a Darne 7.5 mm machine gun. A Hispano Suiza engine of 720 h.p. was mounted in the engine nacelle pod,

directly above the wing. Two prototypes were built during 1939 and 1940, which were used for test flight purposes only. Unfortunately, the results of those test flights and the fate of the two prototypes has been lost with the passage of time.

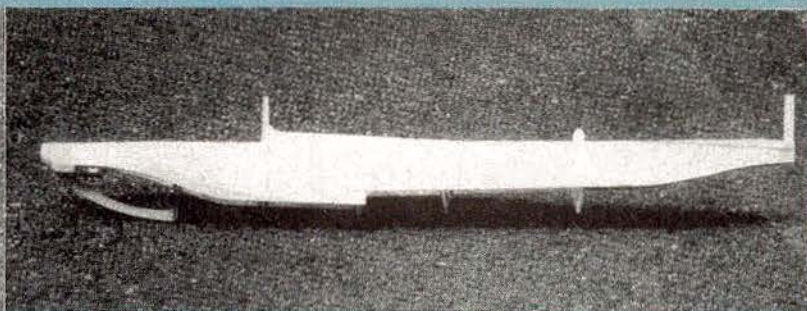
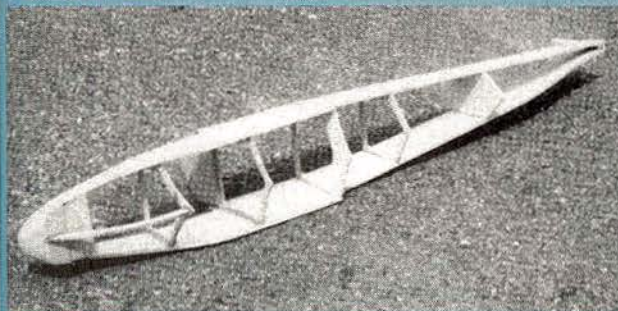
## CONSTRUCTION

The construction of this, as well as

any other "built from plans model," can be made "kit like" by fabricating all of the formers, ribs, fuselage sides, bulkheads, etc., prior to actually starting the assembly process. Construction of the model seems to proceed more rapidly by this method and is more enjoyable. The Nautilus builder will note that the wing ribs are fabricated via the template sandwich method. The centermost rib (W1) and the tip rib (W11) templates are cut out of scrap plastic laminate, 1/16" aluminum, 1/8 plywood, etc., and drilled for bolting together. Once these templates are made, eleven pieces of 3/32" sheet balsa are "sandwiched" between the two templates and the entire assembly is bolted together. The rib blanks are then cut and sanded to shape. This interpolation method of cutting out the wing ribs eliminates the tedious task of hand cutting each individual rib. The templates are reversed and eleven more sheet balsa rib blanks are







The basic fuselage structure is very simple, using 3/16" balsa sheet sides and 1/8" plywood formers and keel.

inserted between them to fabricate the wing ribs for the opposite wing panel. Wing ribs number W1, W5, and W7 also require a 1/16" plywood reinforcing doubler rib. Use the fabricated balsa wing ribs as templates for cutting out these plywood doubler ribs.

We elected to construct the fuselage first. Care should be taken to insure that the fuselage structure is assembled in a straight and symmetrical manner.

A fuselage assembly jig is a great asset in accomplishing this. The 3/8" x 1/2" tail post piece is glued in place at the aft end of the fuselage structure and former F1A at the front. After the fuselage formers have been glued in place, the fuselage sheeting is installed. Start planking the fuselage from the nose (or bow) back to the hull step, and then from the step to the water rudder location. Glue the F6A block in place and then plank the remainder of the fuselage. Install the water rudder assembly, servo rails, servos, and control pushrods before planking the top portions of the fuselage. Be sure that all of these control functions are operating smoothly before installing the top planking because they will become inaccessible at that point. Install the front cockpit flooring and cut away the fuselage top portion to accept the gunners cockpit flooring and formers. Install the nylon wing bolt attachment brackets.

Both the front canopy and gunner windshield are fabricated from clear butyrate plastic sheet.

Construct the vertical fin/rudder, and stabilizer/elevator assembly as indicated on the plan sheet and sand them to the proper airfoil. The tail surfaces are now glued in place, making sure that each is properly aligned.

The basic wing panel structures are constructed by aligning the respective wing ribs onto the notched wing spar assemblies and lower wing sheeting, and gluing them in place.

Glue the sub leading edges in place. Cut out the portions of ribs W2 through W11 to accept the 3/8" x 1/2" aileron framing pieces. Be careful not

## BREGUET BRE 790

### NAUTILUS

Designed By:

Pavel Bosak

### TYPE AIRCRAFT

Semi-Scale Flying Boat

### WINGSPAN

55 1/2 Inches

### WING CHORD

7-9/16" (Avg.)

### TOTAL WING AREA

401 Sq. In. (Approx.)

### WING LOCATION

Shoulder

### AIRFOIL

Flat Bottom

### WING PLANFORM

Double Taper

### DIHEDRAL EACH TIP

1-3/16 Inches

### O.A. FUSELAGE LENGTH

42-5/16 Inches

### RADIO COMPARTMENT SIZE

(L) 14 1/2" x (W) 3 3/8" x (H) 3"

### STABILIZER SPAN

16 1/2 Inches

### STABILIZER CHORD (incl. elev.)

5 Inches (Avg.)

### STABILIZER AREA

84 Sq. In. (Approx.)

### STAB AIRFOIL SECTION

Symmetrical

### STABILIZER LOCATION

Midway on Vertical Fin

### VERTICAL FIN HEIGHT

8 3/8 Inches

### VERTICAL FIN WIDTH (incl. rud.)

6 Inches (Avg.)

### REC. ENGINE SIZE

.40 2-stroke

### FUEL TANK SIZE

8 Oz.

### LANDING GEAR

NA

### REC. NO. OF CHANNELS

4

### CONTROL FUNCTIONS

Rud., Elev., Throt., Ail.

### BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Spruce
Empennage	Balsa
Wt. Ready To Fly	72-80 Oz.
Wing Loading	25.7-28.7 Oz./Sq. Ft.

to get any glue on the inner faces of the two 3/8" x 1/2" pieces. Add the aileron cap ribs. Remove one wing panel from the building board and block up the tip to accept the plywood dihedral braces. Glue the dihedral braces in place along with the leading edge 3/8" hardwood dowel and wing bolt filler blocks. Glue the top sheeting in place. Remove the joined wing assembly and after trimming and sanding it, add the leading edge and tip blocks. Sand to the indicated airfoil. The ailerons are now cut out and the torque rod assemblies are installed along with the aileron hinges. (Do not glue the hinges in place at this point if the wing is to be finished with plastic film type covering.) Cut the required openings for the engine nacelle and tip float struts. Glue the plywood wing bolt plates in place. Cut out the aileron servo well and install the servo mounting blocks.

The tip floats are cut from light weight balsa blocks and sanded to shape. The float struts are fabricated from 1/8" x 3/8" spruce.

The engine nacelle struts are cut from 1/4" and 1/8" plywood.

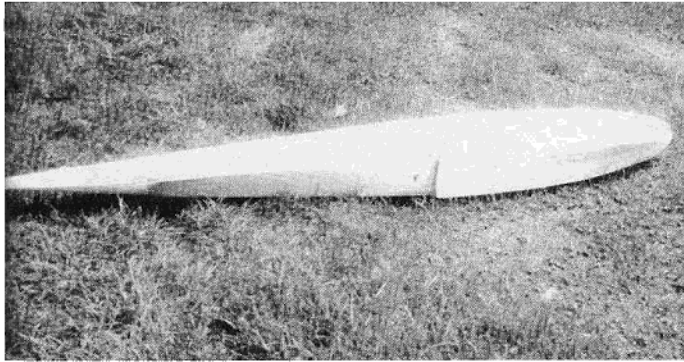
The engine nacelle is constructed around the 1/4" plywood base plate and respective formers. Carefully position the engine nacelle with the struts so as to achieve the proper thrust alignment in relation to the wing and empennage assembly. When everything is aligned properly, glue the engine nacelle-strut-wing assembly together. Install the fuel tank and plank the engine nacelle.

With the wing mounted to the fuselage/hull assembly, glue the formers and sheeting on top of the wing center section in place.

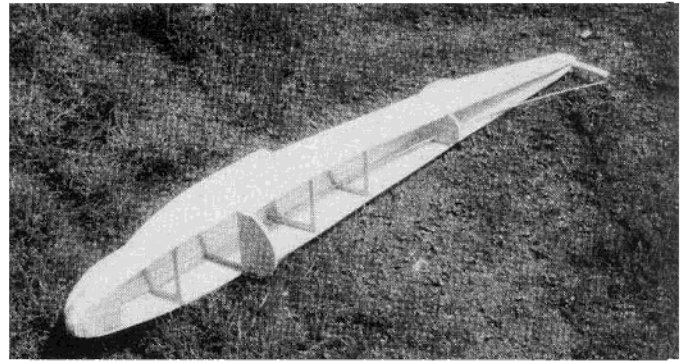
The basic assembly is complete and radio components, linkages, canopies, etc., should now be installed. After finish sanding, the Nautilus is ready for finishing.

The choice of finishing materials is left to the builder. My Nautilus was finished by doping tissue over all finished structures. After filling and fine sanding, a painted fuelproof finish was applied. The original Nautilus prototypes were dark blue on the top of the wing and light blue on

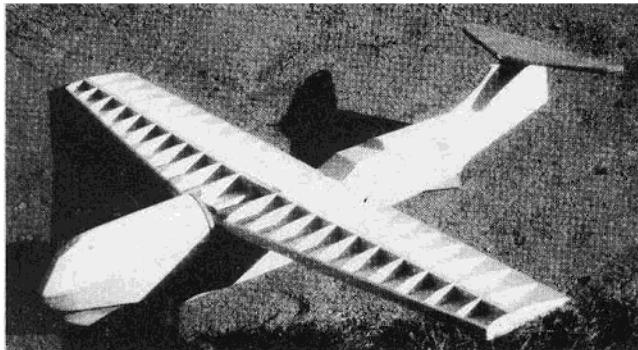




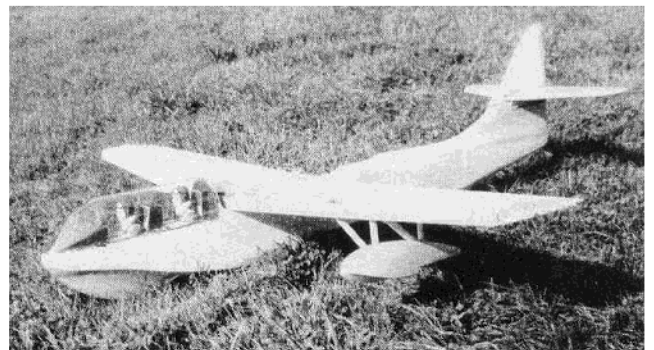
*1/8" hard balsa is used to plank the forward portion of the hull bottom. The aft section is planked using lighter 1/8" balsa to help keep the weight down behind the C.G.*



*After the hull bottom has been installed, the nose block can be contoured to match the hull. Install the water rudder, servo rails, and pushrods before planking the top of the fuselage.*

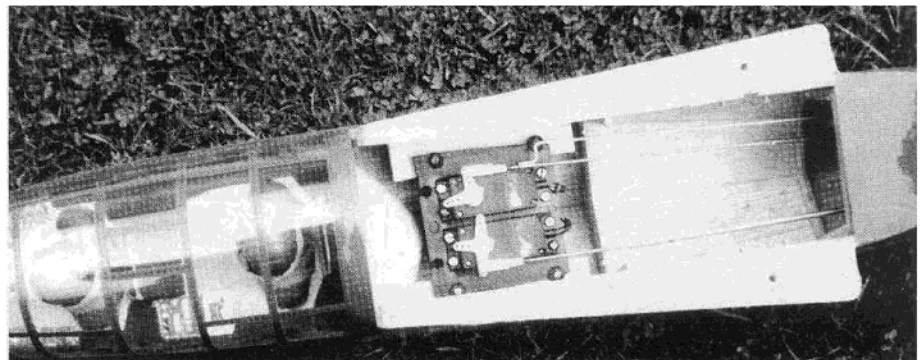


*The wing is built up directly over the plans and is sheeted with 3/32" balsa on both the top and bottom. The top wing sheeting is not added until after the two wing panels have been joined at the proper dihedral angle. The horizontal stabilizer uses 3/32" sheeting over a 3/16" x 3/8" framework. Balsa blocks are glued together and then shaped to form the mold for the clear acetate canopy.*



the bottom surface. The fuselage and floats sides were light blue and the bottom surfaces were light gray. French roundel markings were on both wings, top and bottom, and the rudder featured standard French tri color markings and the words "Breguet Bre 790 Nautilus."

When finished, be sure that the aircraft balances at the indicated Center of Gravity point. As most of the structure and component parts are behind the Center of Gravity, it is highly probable that weight will have to be added to the nose, in order to achieve the desired Center of Gravity. The amount of required weight will be dependant upon several factors such as engine used, finishing method, weight of wood used in construction,



*Spacious radio compartment provides ample room for all radio gear. Keep all equipment as far forward as possible. Note that the water rudder linkage is attached directly to the rudder pushrod.*

and building technique.

#### **Flying:**

Be sure all control surfaces are

operating smoothly and the engine is properly adjusted.

The recommended control surface



*The completed model has clean, simple lines and is as beautiful in the air as it is on the ground.*

travel limits are as follows: Ailerons — 11/32" each direction, Elevator — 11/16" up and down, Rudder — 1" each direction.

The Nautilus builder should first become accustomed to its maneuvering characteristics on water. Once this is accomplished, the maiden flight can be attempted by applying full throttle. The Nautilus should come up on the hydrodynamic step after traveling about 40'. This distance will vary depending upon the engine used and the water surface conditions. Be careful not to apply full rudder movements as the rudder is

quite efficient. Full rudder travel movement may cause a wing tip to go underwater. After the Nautilus is on the hydrodynamic step and tracking straight, simply feeding in a small amount of up elevator will cause the Nautilus to become airborne. If the Nautilus is built and balanced correctly, it should possess very docile inflight characteristics. It is not a highly aerobatic aircraft, nor was it intended to be. Its inflight performance is well within the capabilities of any RC'er who has mastered the basics of flight. The Nautilus is a fun type sport scale

aircraft and that is about all I can say about it. If anyone has any inquiries about the Nautilus, I would be happy to attempt answering them. My name and address are as follows: Pavel Bosak, Zahradni 731/III, 339 01, Klatovy, Czechoslovakia. Good luck "Hodne stesti" and good flying. □

**From  
RCModeler  
Oct. 1989**