SEAGULL III

By A.G. Lennon

High performance amphibious flying boat for .46 2-stroke engines

The Seagull III is a flying boat that may be converted for land flying by the easy addition of tricycle landing gear.

Its basic hull and acrodynamic design have been discussed in this author's series on "Hull and Float Design" which were published in RCM (Feb., Mar., and April 1991).

Its performance has exceeded its designer's expectations. Its low drag and the power of the O.S. Max .46SF engine are contributing factors.

Take-offs from both land and water, with the big slotted flaps half extended, are under 25 feet. It is highly aerobatic; the NASA droop and RAO slots permit very slow flight. With flaps fully extended, engine idling, and with up-elevator holding it at a high angle of attack, aileron control is still effective.

The model's top speed is estimated at 75 mph, and in the slow flight configuration, described above, 20 to 25 mph.

Because of its low drag, landings can consume a considerable distance as the plane floats in ground effect. Full flap extension is almost mandatory; and permits steep, relatively slow approaches.

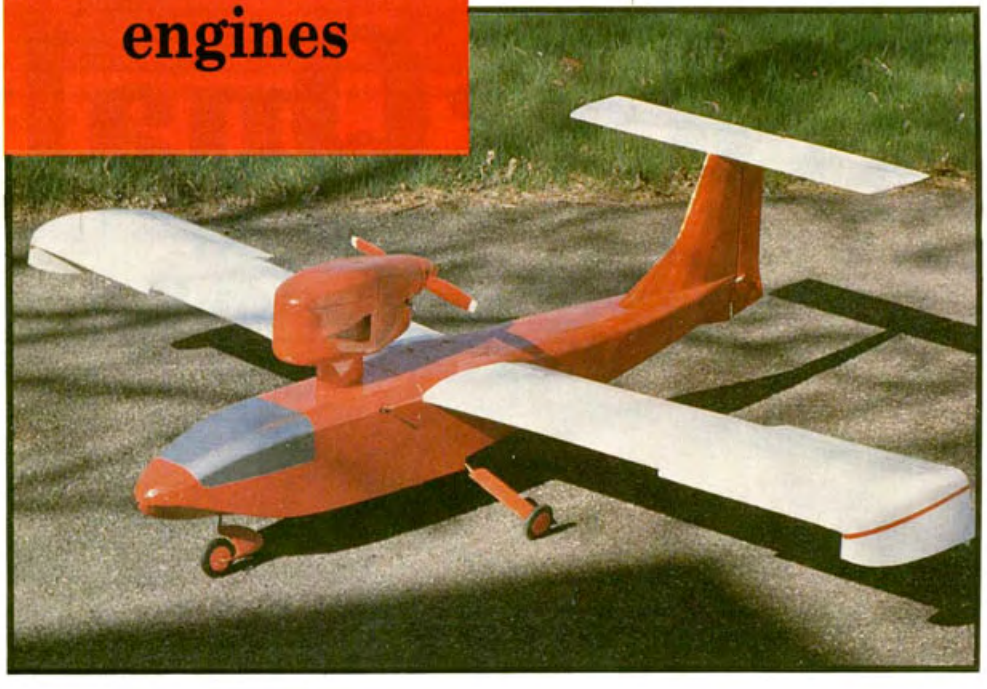
With its high thrust line and low center of drag, there was serious potential for marked trim changes, with changes in engine rpm's. By judicious use of the prop slipstream, this problem was overcome, and it exhibits no pitch variation with power changes.

A surprise bonus was the absence of either nose-up or nose-down pitching when the flaps are extended. Both these factors add to the enjoyment of flying the Seagull III.

The model has been thoroughly flight tested, both on land and water, by four friends (and fellow club members), and all very capable pilots. They have enjoyed its performance.

Its water behavior is excellent. Spray is well controlled; it gets "on the step" quickly without spray hitting the prop. It weathercocks into the wind and the water rudder is effective.

The steerable nosewheel permits easy

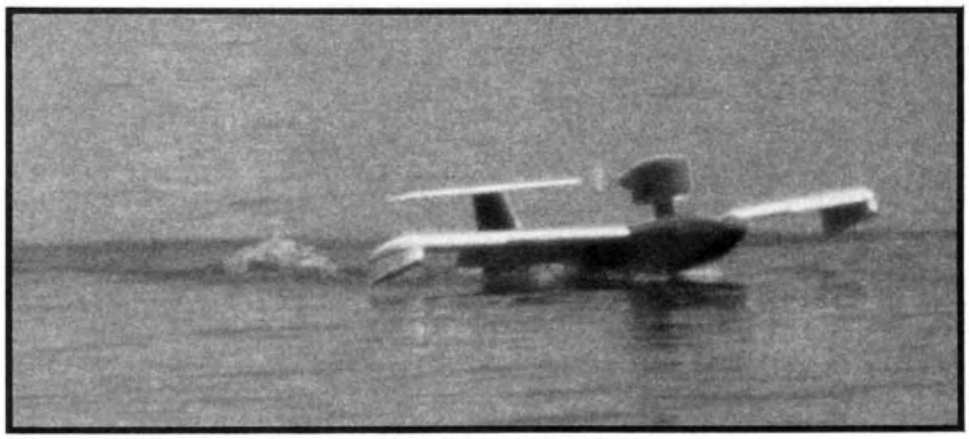


ground maneuvering. The landing gear has proven rugged against the abuse of hard landings.

During the first two or three flight tests, some very unusual behavior became apparent. Coming out of a level left-hand turn, the model continued into an uncommanded right-hand turn, accompanied by nosing down moderately. This surprising behavior was easily controlled by left aileron and up-elevator, but it was annoying; particularly when the model performed so well otherwise.

During these early flights, a Graupner 11 x 8 pusher prop was installed. It is an excellent prop, but heavy. At 1½ ozs., it is double the weight of a wooden equivalent.

Theorizing that the cause of this aberration might be "Gyroscopic Precession," exaggerated by the high thrust line, the prop was changed to a Zinger 11 x 8 wooden pusher prop, weighing 3/4 oz.



Water landing with full flaps extended. Spray is well controlled.

Subsequent test flights confirmed the theory. The unusual behavior disappeared. While use of wooden props for water flying is not recommended due to spray damage, the location of Seagull III's prop, over the wing and "clean running" hull, result in the absence of spray impingement on the prop.

The control surfaces are all mass balanced at their hinge lines to suppress flutter. This model achieves very high speed in a dive.

This author is addicted to inverted and fully cowled engines and mufflers. Exposed, these increase — and probably double the model's total drag and are "ugly!"

SEAGULL III

Designed By:
A.G. Lennon
TYPE AIRCRAFT
Amphibian
WINGSPAN
69.7 Inches
WING CHORD
10.75 Inches
TOTAL WING AREA
694 Sq. In.
WING LOCATION
Top of Hull
AIRFOIL
Eppler E197/E197 Mod
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1-9/16 Inches
OVERALL FUSELAGE LENGTH
54.5 Inches
RADIO COMPARTMENT SIZE
Ample
STABILIZER SPAN
25.2 Inches
STABILIZER CHORD (incl. elev.)
5.9 Inches
STABILIZER AREA
150 Sq. Inches
STAB AIRFOIL SECTION
Eppler E168
STABILIZER LOCATION
Top of Fin (T-Tail)
VERTICAL FIN HEIGHT
12 Inches
VERTICAL FIN WIDTH (incl. rud.)
8.75 Inches (Avg.)
REC. ENGINE SIZE
.46 Cu. In.
FUEL TANK SIZE
8 Oz.
LANDING GEAR
Tricycle (Removable)
REC. NO. OF CHANNELS
5
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail., Flaps
BASIC MATERIALS USED IN CONSTRUCTION

Hull	Balsa & Ply
Wing	Balsa, Ply & Basswood
Empennage	Balsa & Ply
Wt. Ready To Fly	112 Ozs. (7 Lbs.)
Wing Loading	23.24 Oz./Sq. Ft.

CONSTRUCTION

Construction of Seagull III is based on the stressed skin concept of locating material as far from the neutral axis as possible for maximum strength with minimum weight. The internal structure is relatively simple and all surfaces are sheet balsa, covered in MonoKote, resulting in a warp free, rugged model.

The drawings are very detailed, so many component parts are not difficult to make.

What follows addresses the sequence of sub-assemblies and assemblies for each component leading to final assembly — along with engine starting and flying.

Hull

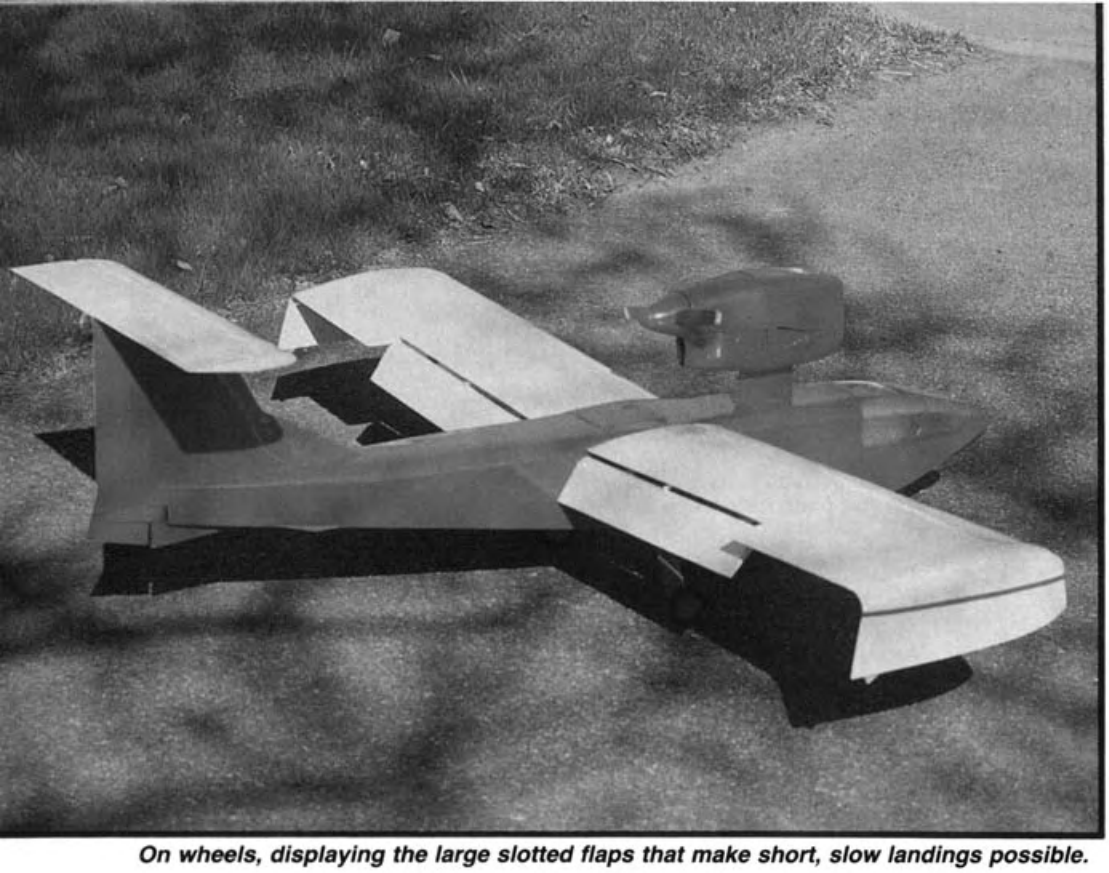
Assemble the hull bulkheads. Install all the internal nose wheel hardware to Bulkhead #2. Along with the 1/4" triangular bracing. The receiver switch is assembled to Bulkhead #5. The double walled portion of Bulkhead #7 forms the socket retaining the main landing gear legs. Note the triangular bracing.

The hull sides and all bulkheads should be jig assembled for accuracy. Install cable sheaths for elevator and rudder — and sheath cable and ball joint for nose wheel steering. Install the receiver/battery box between Bulkheads #5 and #6 with its foam lining. Install battery and receiver and run the antenna through the bulkhead holes. Add the top 1/4" sq. balsa strips from Bulkhead #1 to #4 — #5 to #6, and #8A to #10. Cement the top skins in position. Note the rectangular cut out for the nacelle pylon — and its 1/2" triangular bracing between Bulkheads #5 and #6.

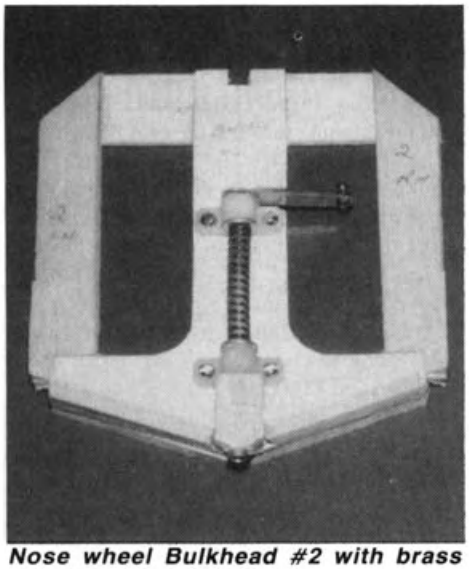
Invert the hull in its jig and add fore and after-body keels and 1/4" sq. balsa chine strips. Sand keels and chine strips to the 5° hull bottom deadrise angle. Cement the after-body bottoms of 3/32" balsa, 3" wide, joined lengthwise on the after-body keel.

The fore-body bottom is covered similar

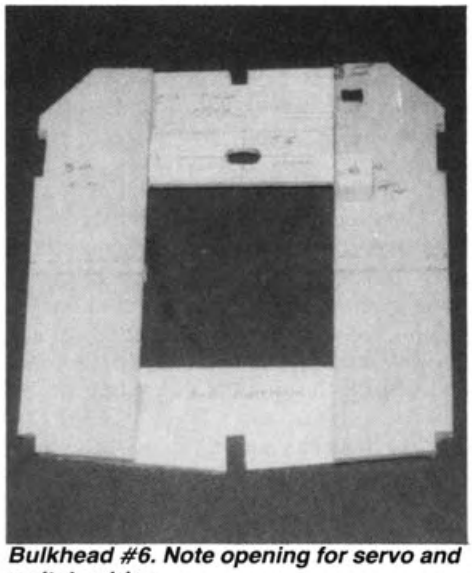
Water take-off. Note the clean running hull.



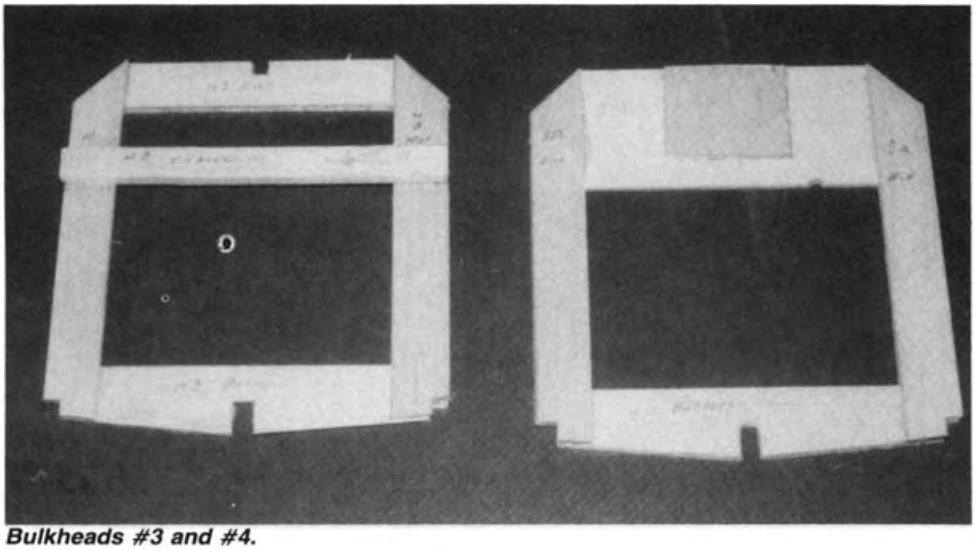
On wheels, displaying the large slotted flaps that make short, slow landings possible.



Nose wheel Bulkhead #2 with brass tubing and brackets in place.



Bulkhead #6. Note opening for servo and switch wiring.



Bulkheads #3 and #4.

to the after-body, but the balsa sheeting should be softened in hot water and bent, pinned, and clamped in position to dry before cementing. The chine flair strips are added to the fore-body bottom with the inner edges parallel to the keel centerline — and trimmed to the hull sides.

The top corner sheets of 3/16'' balsa are added next. Note the five step procedure for this addition shown in the bulkhead drawings Plan Sheet #1. Add and shape the nose block. Install the ply servo mounts for elevator and rudder — and the 3/32'' ply skeg.

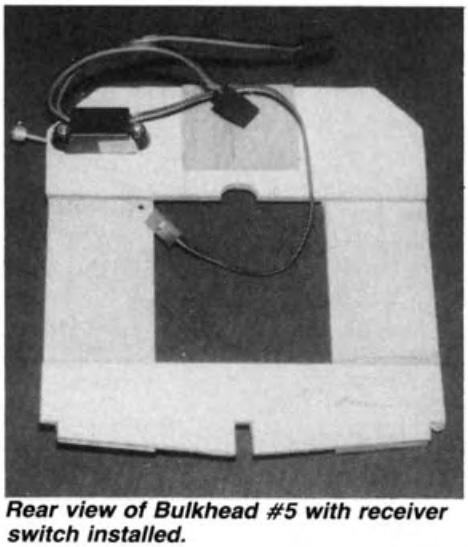
Pylon and Nacelle

Assemble the 3/32'' ply sides and 1/2'' balsa core of the pylon. Note the 1/2'' x 3/8'' basswood strip and the open vertical slot for the engine servo wiring. The balsa fairings between the nacelle bottom and hull top are added and sanded to shape. Install the NASA scoop sides and bottoms in the nacelle sides — and cement the 3/16'' sq. balsa top edge strips in place. These sides, the tank base, Bulkheads #N1, #N2, and #N3, the bottom skin and the pylon should be jig assembled, inverted on a flat surface with the upper part of Bulkhead #N3, overlapping the edge so that the nacelle rests on the sides with the 3/16'' sq. balsa strips. The removable cover is built on the nacelle for a good fit. The upper and lower corners are installed using the five step procedure as for the hull's top corners. Add and shape the upper and lower nose blocks. The nacelle and its pylon should be installed on the hull only after both are covered.

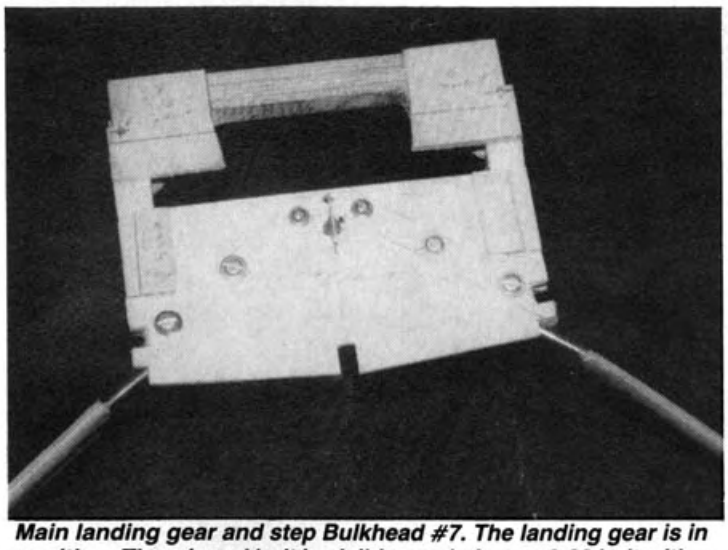
Engine Cowling

This is composed of ten pieces of 1/2'' balsa sheet as shown on the plans, along with a 3/32'' ply spinner ring and lower piece. Note the two 1/32'' ply formers cemented to the upper and lower cowl sections at the parting line.

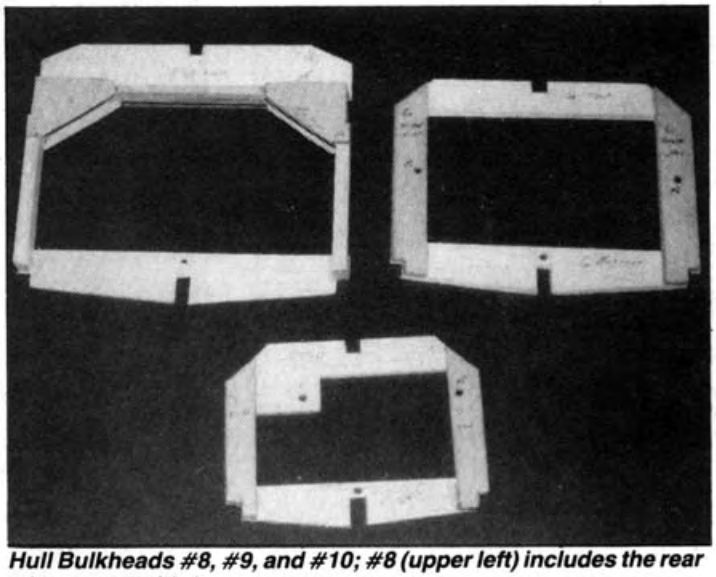
Install engine, muffler, and engine mount on Bulkhead #N3. After assembly of upper and lower boxes and plywood components, sand out the cowl insides to clear muffler, needle valve, and exhaust stacks. A 5/8'' dia. dremel sanding drum and drill will do this sanding easily (but dusty)!



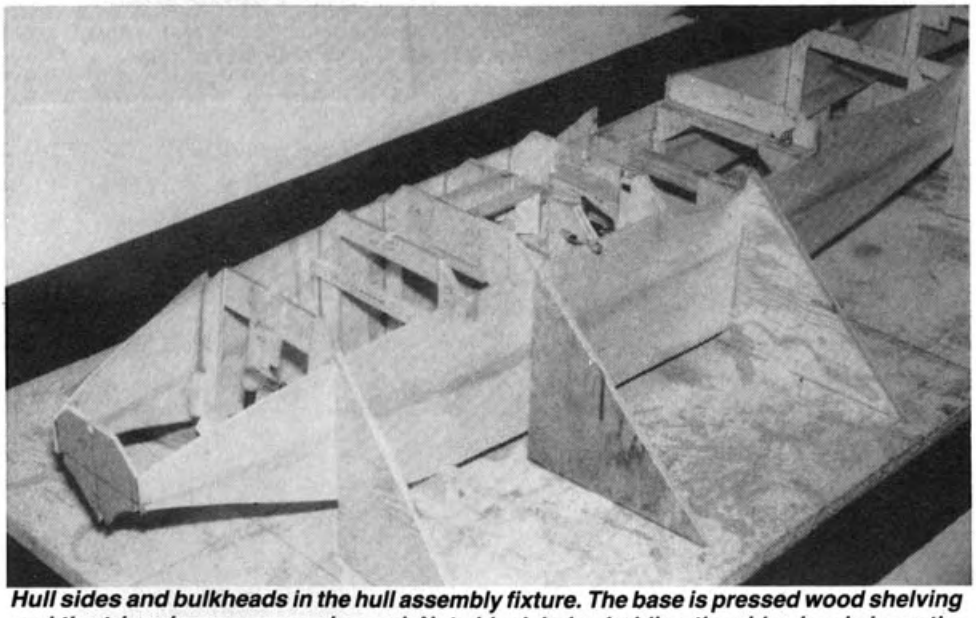
Rear view of Bulkhead #5 with receiver switch installed.



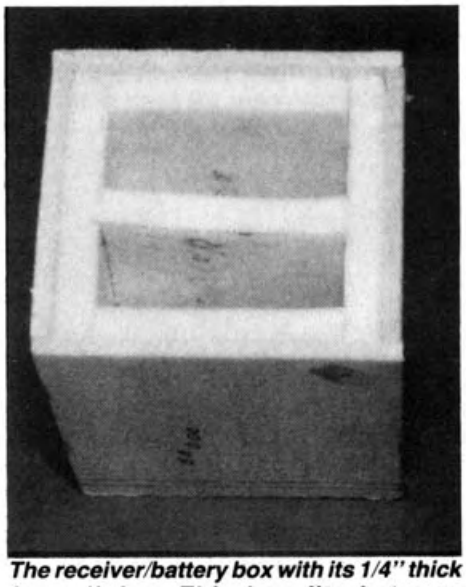
Main landing gear and step Bulkhead #7. The landing gear is in position. The winged bolt is visible, made from a 6-32 bolt with a 1/32" brass sheet wing soldered in the bolt head slot.



Hull Bulkheads #8, #9, and #10; #8 (upper left) includes the rear wing spar hold-down.



Hull sides and bulkheads in the hull assembly fixture. The base is pressed wood shelving and the triangles are scrap plywood. Note block balsa holding the sides level above the base.



The receiver/battery box with its 1/4" thick foam lining. This box fits between Bulkheads #5 and #6 with the open end facing rearwards.

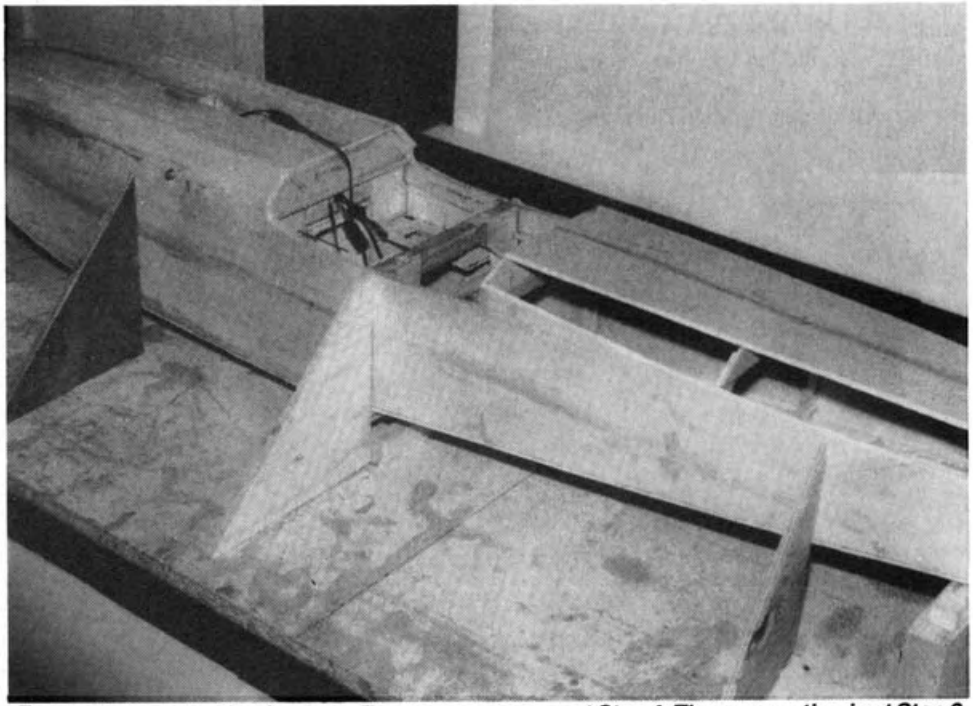
Lightly cement both upper and lower cowl sections to Bulkhead #N3; install the Fox 3/4" shaft extension and an old 2½" dia. spinner skirt on the crankshaft. Using 1/16" balsa strips as spacers, install the Fox propnut and washer, align the ply spinner ring and spinner skirt, and tighten the prop nut to clamp the cowl in position. Shape and sand the outside contours of the cowl to the nacelle, spinner skirt, and to the two 1/32" ply formers.

Note the 1/4" tri stock baffle inside the lower cowl, on the side opposite the muffler.

The upper cowl is cemented firmly to the Bulkhead #N3. The lower removable portion is held by three Goldberg flat hold-downs and must be installed from the muffler side. Once the hooks on all three flat hold-downs are aligned with the shoulder screws, a knuckle rap on the cowl side will engage hooks and screws. Similarly, a sharp rap on the opposite side will disengage the hooks for very easy cowl removal.

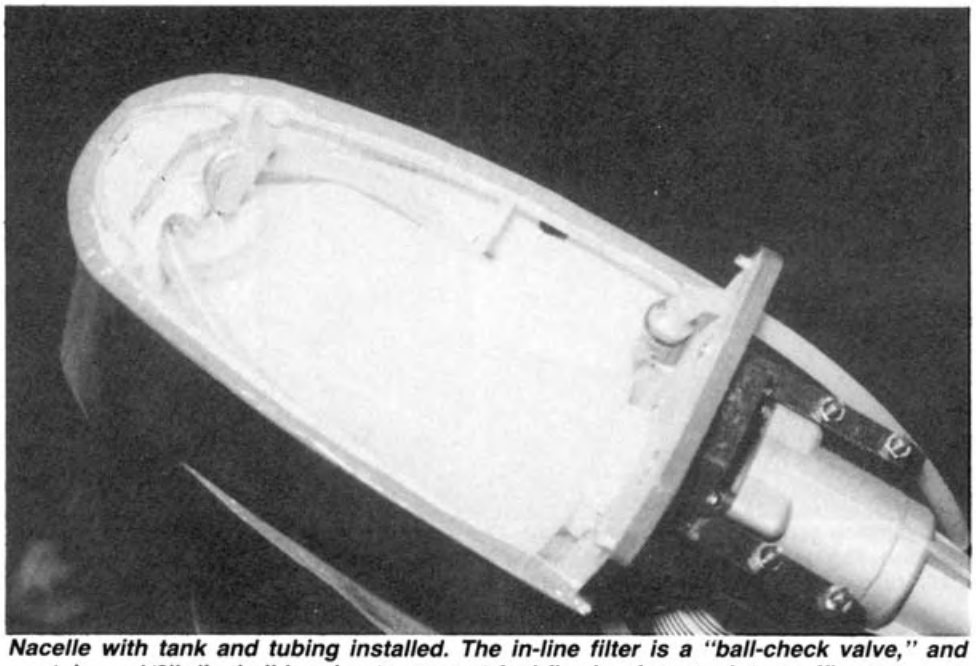
Exhaust Stacks

The 9/32" O.D. brass tube exhaust

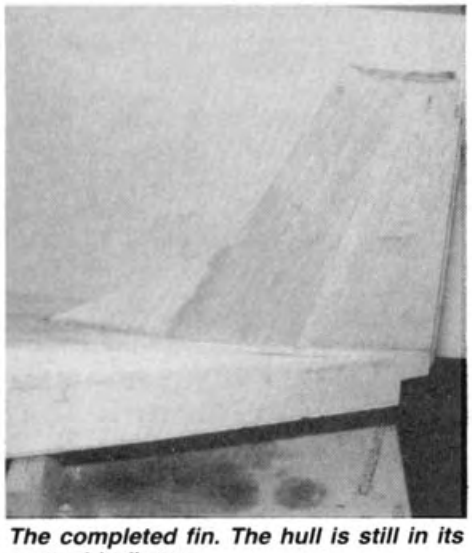


Forebody top sheeting in place. The top corners are at Step 4. The rear portion is at Step 2, awaiting the 3/16" balsa sheeting. Note leveling blocks under the sides.

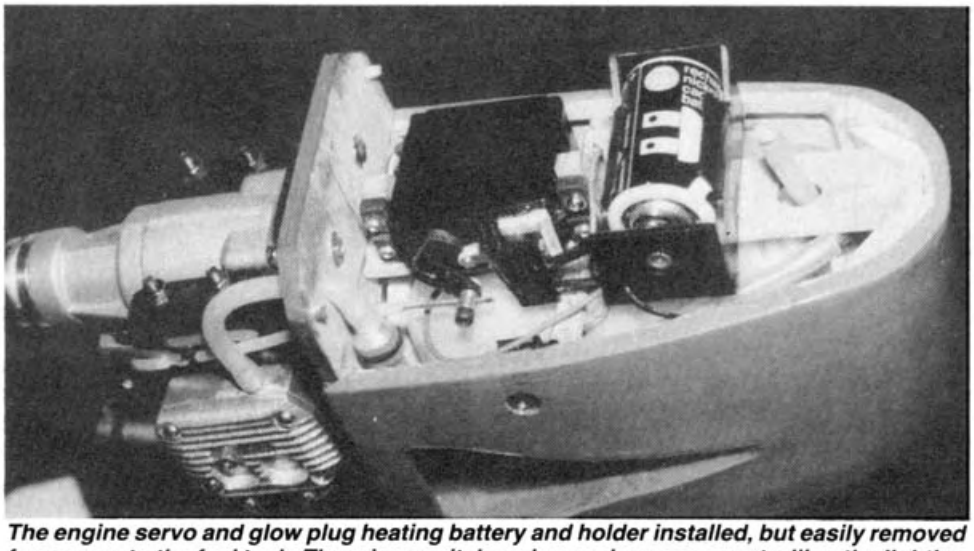
Start of fin assembly. Note elevator and rudder cable sheaths, and how the end of the aerial is secured to the fin rear spar with thread. The top block is in place awaiting the second, left hand skin.



Nacelle with tank and tubing installed. The in-line filter is a "ball-check valve," and contains a 1/8" dia. ball bearing to prevent fuel flowing from tank to muffler.



The completed fin. The hull is still in its assembly fixture.



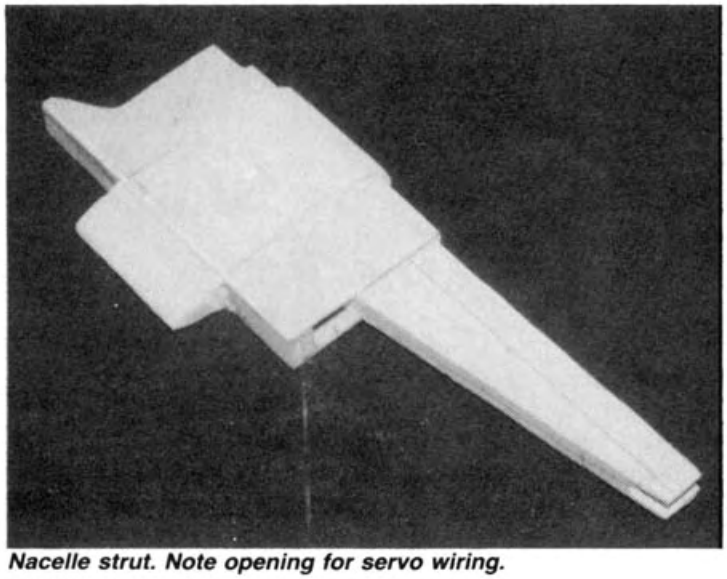
The engine servo and glow plug heating battery and holder installed, but easily removed for access to the fuel tank. The micro switch and servo horn cam controlling the lighting of the glow plug at low engine rpm's is also visible.

stacks are bent with 1/4'' O.D. extension springs inserted at the bend locations. Heated with a propane torch, the tubing bends readily when the metal temperature is right. (Wear heavy gloves.) The internal springs prevent kinking and are removed when the bending is finished. Note that the muffler's stacks are cut short.

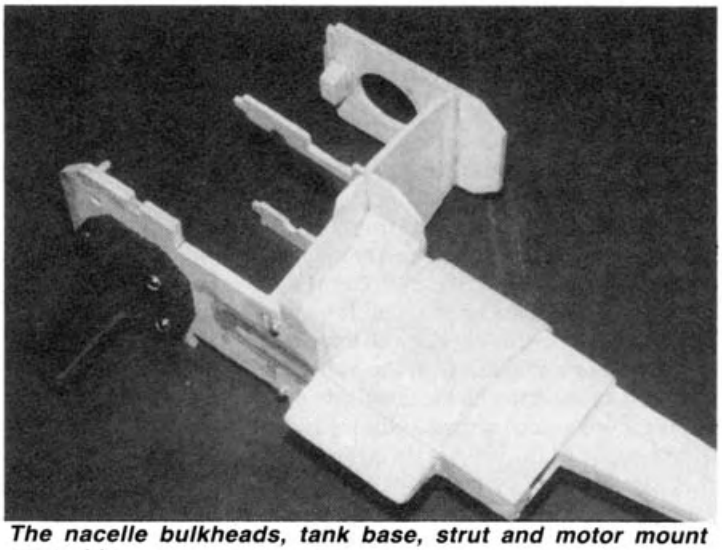
Wings

Subassemblies to be done before wing construction starts are as follows:

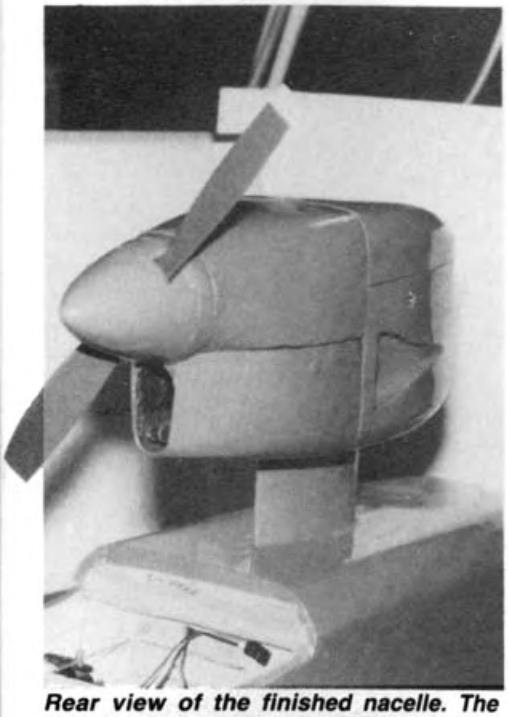
(1) Assemble ply flap supports to Ribs B and F for both wing panels. This must be done accurately; the pivot pin location is critical for good flap operation.



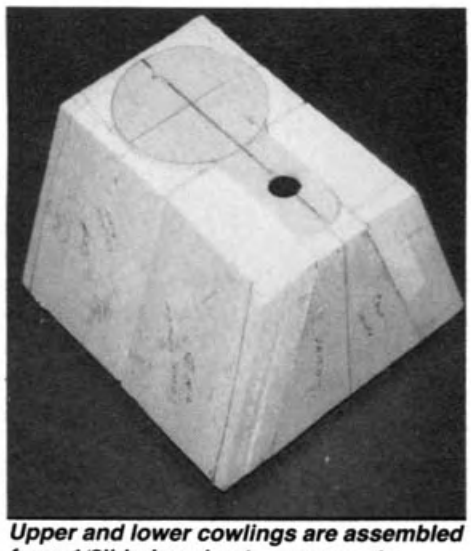
Nacelle strut. Note opening for servo wiring.



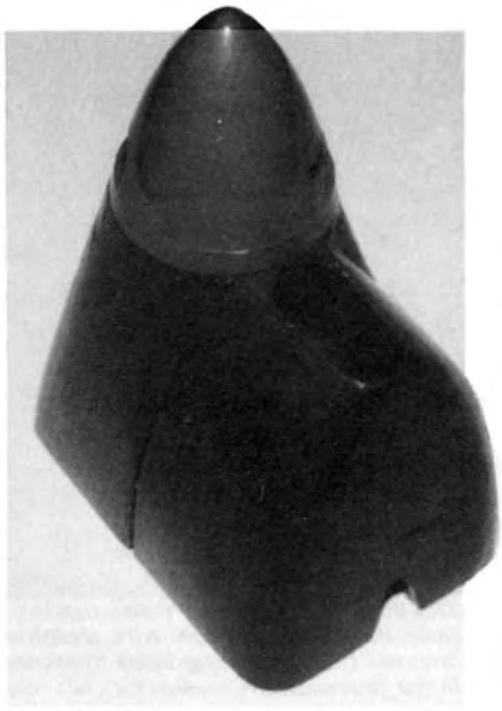
The nacelle bulkheads, tank base, strut and motor mount assembly.



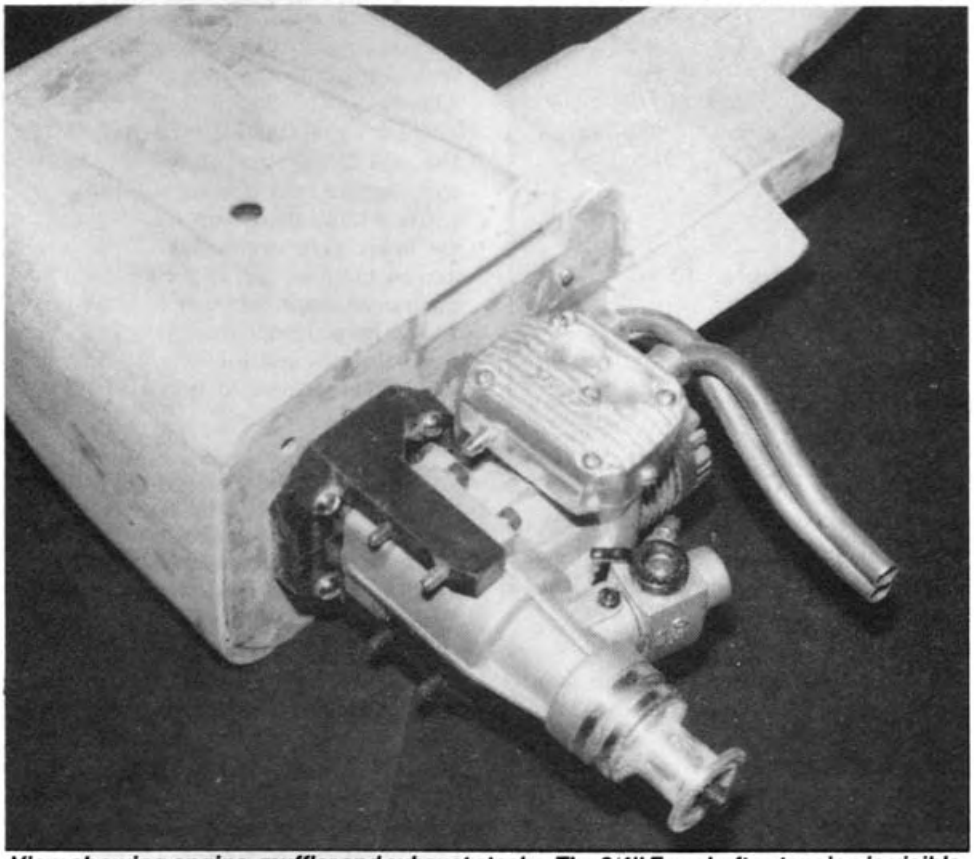
Rear view of the finished nacelle. The NASA scoops and air exit (under the spinner) are shown. The brass tube exhaust stacks are just visible.



Upper and lower cowlings are assembled from 1/2" balsa sheet components.



The finished cowl. The upper part is cemented to the engine bulkhead. The lower is easily detached for engine servicing.



View showing engine, muffler and exhaust stacks. The 3/4" Fox shaft extension is visible. The priming hole in the muffler is visible. Safety nuts have NOT been installed on engine hold-down bolts.

(2) Install sheath anchors on Ribs A-D, and H.

(3) Install Ribs G and G2 on Rib H.

(4) Install flap and aileron short ribs on Ribs A and H.

The wing assembly fixture is very simple. Obtain a long flat surface, such as a pressed wood shelving. Rubber cement the wing drawings lightly to this surface, arranging the rear spar outline on one edge of the surface so that the flap supports extend beyond and below the edge. Again, lightly rubber cement 1/4" sq. balsa strips directly over front and rear spar outlines. Pin the lower front and rear spars to the 1/4" sq. strips, install all ribs, except Ribs A, and add upper spars.

The spanwise location of flap support ribs B and F are critical. Their spacing must fit the flap pivot rib spacing and also position the flap correctly spanwise relative to the wing. It would be advisable to build and use the flaps themselves for this purpose.

Cement in the front and rear spar webbing (grain vertical). Over a candle flame, carefully bend the outer plastic sheaths for ailerons and flaps to drawing and install in the wing. CA the sheath ends in the sheath anchor blocks and at each rib through which they pass. Add the 3/16" sq. balsa leading edge strips for both panels.

When both panel frameworks are completed, join the two using the front and rear center section spars and Ribs A. Prop the outboard wing ends to the dihedral shown in the drawings and add the 1/16" ply webs for front and rear spars, between Ribs A and B.

The 1/16" balsa sheet skins are made up of three sheets on top and bottom of both wing panels, with butt joints on the spar centerlines. Measure the skin panel dimensions from the wing framework carefully.

Install the upper center skins first, with the wing panel on the fixture, first one panel then its opposite number, pinning the skin to the spars until the cement has set. Follow with the lower center skins, turning the wing upside down on the fixture. **At all times,** weight the structure firmly on the fixture to avoid warps.

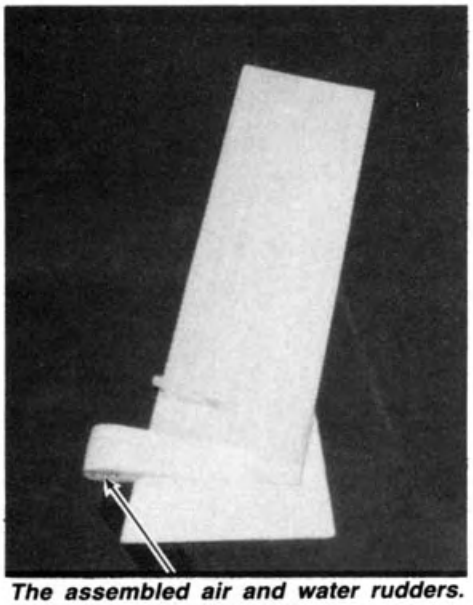
The leading edge upper skins, followed by the lower leading edge skins are similarly installed. Soften the balsa sheet with liquid ammonia to avoid splits.

The same procedure applies to the rear upper and lower skins. At the aileron position, install the diagonal skins from lower rear spar to upper trailing edge. Cut slots for aileron cables in the rear spar web and the diagonal skin. Similarly, cut slots in the rear spar webs for the flap cables.

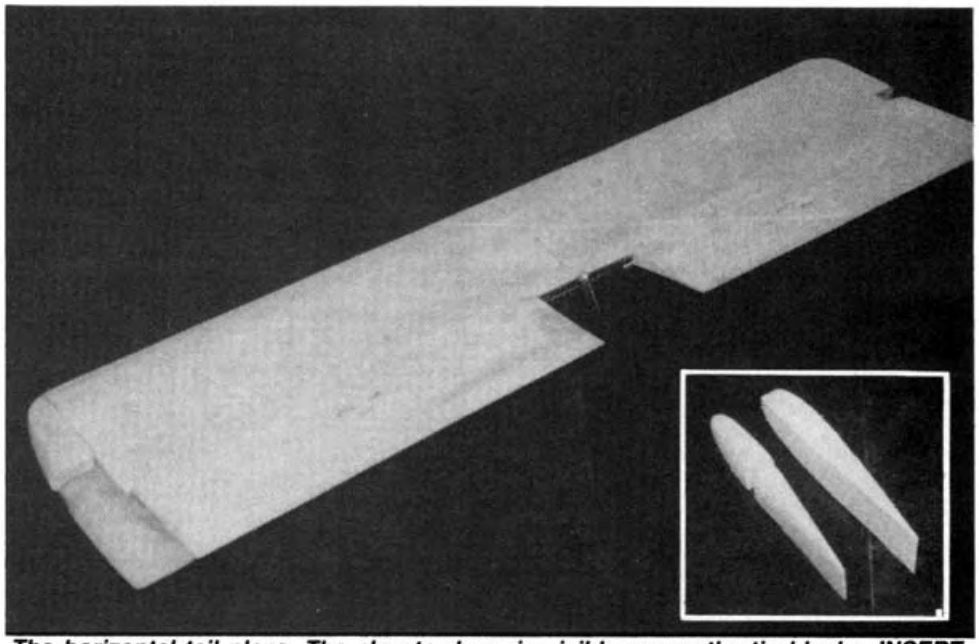
Using 1/16" scrap balsa sheet, cut leading edge templates for both the inboard and NASA "droop" sections. Sand the leading edges to these templates.

Install the ply flap and aileron servo mounts in the wing center section as shown.

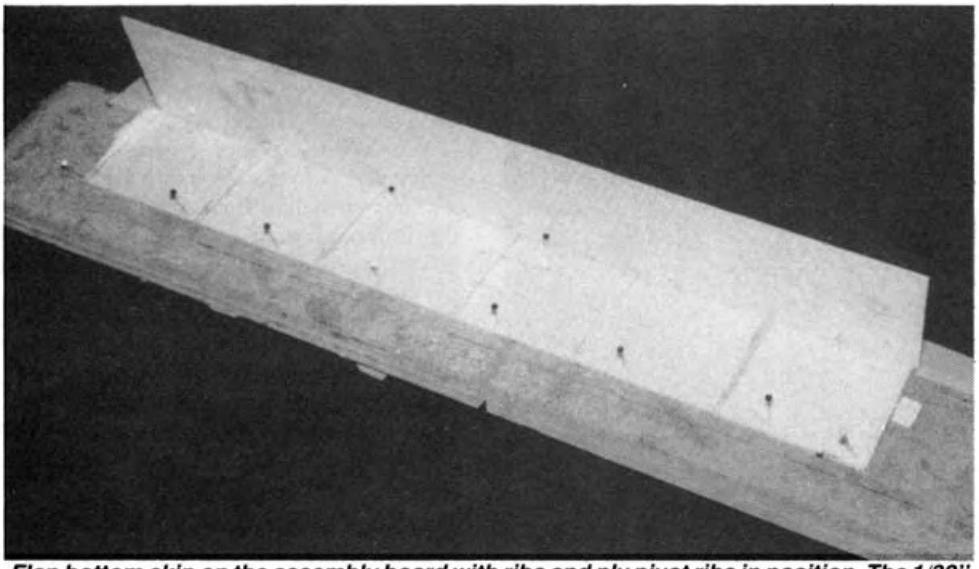
To complete the wing's center section which also forms part of the hull top, install the wing on the hull. Fit the balsa bolt blocks in position and install the wing bolts, threaded into the holes drilled and tapped in



The assembled air and water rudders. Note the 1/8" dia. lead wire weights (arrow) in the projecting balsa block for flutter prevention.



The horizontal tail plane. The elevator horn is visible as are the tip blocks. INSERT: Finished and rough tip blocks of balsa.



Flap bottom skin on the assembly board with ribs and ply pivot ribs in position. The 1/32" x 1/4" balsa strip provides for the slight undercamber of the flap lower surface. The upper and lower skins are securely cemented together at their leading edges. Note plastic strip under the front edge to avoid cementing the flap to the board.

hull Bulkheads #7 and #8. Remove bolts and blocks and replace them cemented in position holding the wing firmly to the hull.

Next, add the triangular stock, top skins, etc., shown in sections D-D, E-E, G-G, and J-J on the drawings on Plan Sheet #2. Sand the center section corners to conform to the hull top corner contours. Install the servo access hatch running from front to rear spars.

Wingtip Floats

Shape the wingtip balsa blocks as shown on Plan Sheet #2. Be sure to make right and left-hand versions.

The floats are of very simple, light yet rugged construction. Soften and pre-bend the front curvature of Rib #2 and assemble the sides and top Rib #1 on the bottom Rib #2. Add the 1/4" balsa nose block and sand to shape.

The floats are cemented to the tip blocks and subsequently these assemblies are fixed to the wing outboard ends.

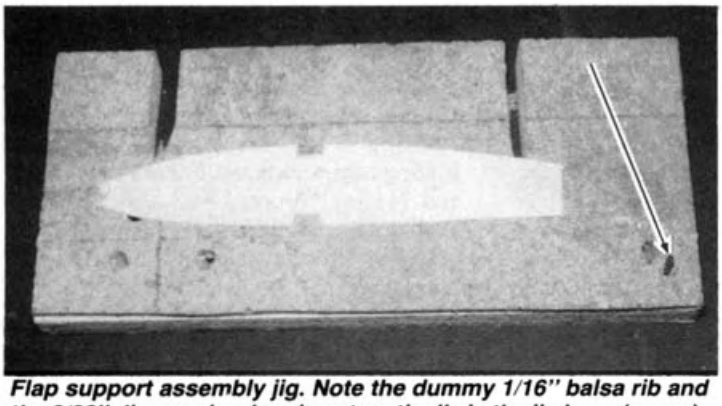
Ailerons

These are assembled on a flat surface. Use of 1/2" plywood surfaced with 1/4" cork, permits easy pinning of skins.

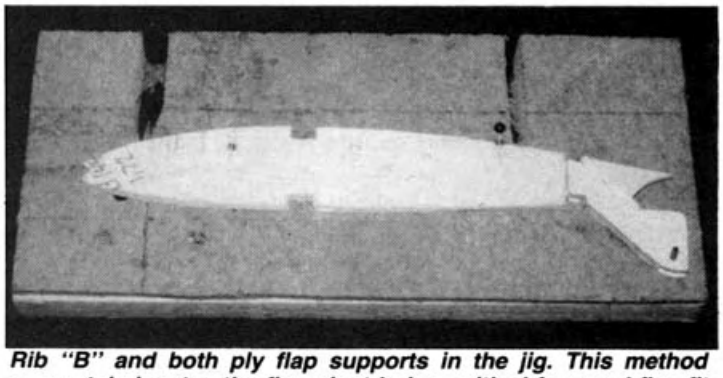
Use a 1/32" balsa strip 1/4" wide under the lower skin lengthwise and centrally located to create the slight undercamber. Cut a small slot in the board to clear the ply aileron horn. Install front spar, ply horn, four balsa ribs and follow with the upper skin. Allow cement to fully set. Sand to drawing.

Flaps

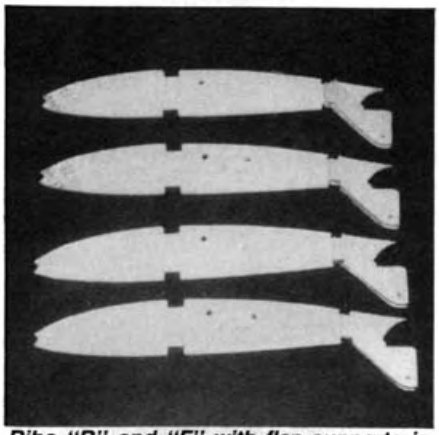
Similar assembly procedure to the ailerons. Cut slots to clear the flap pivot ribs in one edge of the building board. Pin the lower skin in position, add ply pivot and horn ribs — install balsa ribs. Cement the leading edge of the upper skin to the **front** of the lower skin and allow to set firmly. Use plastic or Saran Wrap under the flap leading edge to avoid cementing the flap to the board. Soften the upper skin with liquid ammonia and bend it carefully to the rib upper contours. Be sure the upper skin is



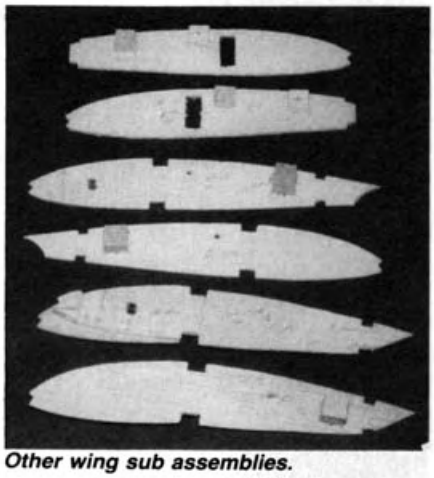
Flap support assembly jig. Note the dummy 1/16" balsa rib and the 3/32" dia. music wire pin set vertically in the jig base (arrow).



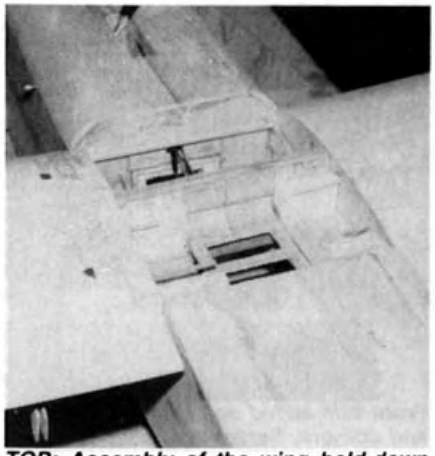
Rib "B" and both ply flap supports in the jig. This method accurately locates the flap pivot holes, critical for good flap fit and functioning.



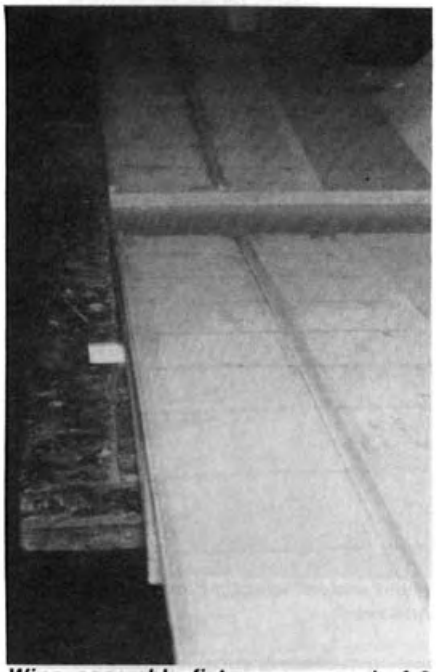
Ribs "B" and "F" with flap supports in place.



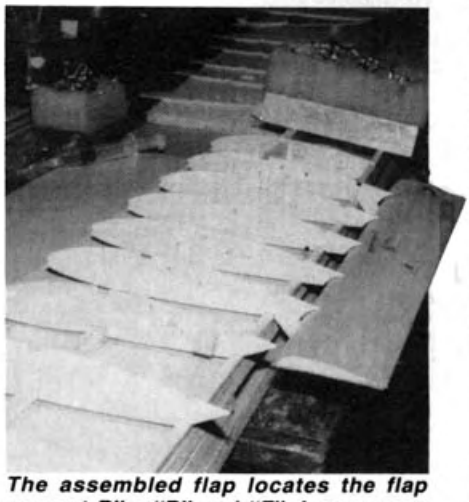
Other wing sub assemblies.



TOP: Assembly of the wing hold-down blocks and top skin is done with the wing carefully aligned on the hull. Fit blocks to bass spars; to Ribs "A" and to bolt holes in the hull bulkheads. Cement them securely, holding them to wing and hull with the four nylon bolts specified, while cement is drying.
BOTTOM: Add front bulkhead, the 1/4" balsa strip over the rear spar and add tri-stock and formers to Ribs "A."

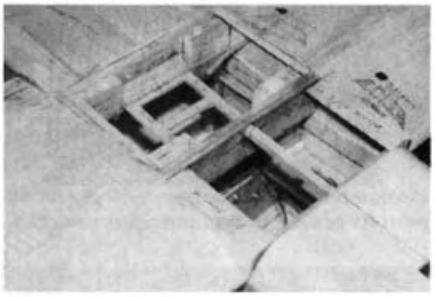


Wing assembly fixture composed of 3 pieces of pressed wood shelving, one as a base, the other two at 3° dihedral each. Tracings of wing drawings giving rib and spar locations are cemented to the shelves as shown. 3/16" sq. balsa strips are bases on which wing lower spars are located. Note that the rear spar is on the shelf edge so that the flap supports will overhang.



The assembled flap locates the flap support Ribs "B" and "F". Lower spars are in position.

The completed basic wing structure. All ribs and spars are in place, webbs installed and the ply servo mount in the wing center section is installed. Plastic sheaths for flaps and aileron control system have been installed and glued into position. The plastic tubing may be pre-bent to drawing with a heat gun carefully, to avoid melting the plastic.



firmly cemented to the ribs for good flap action. Sand to contour shown on drawing.

Elevators And Rudder

Use the same procedure as for the ailerons. Add the bottom block and ply water rudder to the rudder.

Horizontal Stabilizer

Use the cork surfaced building board. Pin the upper, wider skin trailing edge to the board; using a 1/8" x 3/8" balsa strip between the skin leading edge and the board to elevate the L.E. Install the 1/8" rear spar, add the ribs, and the central block rib, all weighted down so that the upper skin conforms to the rib contour. When cement has set, add the bottom skin, similarly weighted down. The 5/16" triangular strip is added to the aft spar and upper skin. Sand to the shape shown on plans.

Shape the horizontal tailplane block tips as shown and then cut them to form the shielded horns for installation on stab and elevators.

Vertical Fin

The fin is built on the hull. Install the rear spar vertical. Add two 1/4" x 1/8" balsa spars, Ribs F3 - F2, and F1, and the block rib forming the stab mount. Install the elevator cable sheath and its anchor, the antenna, and the 1/16" balsa webs on the spars between ribs. Check alignment, then add right and left skins, and the small leading edge block. The 5/16" tri stock is added to the rear spar last. Sand to shape shown on plans.

Control Surface Anti-Flutter Balancing

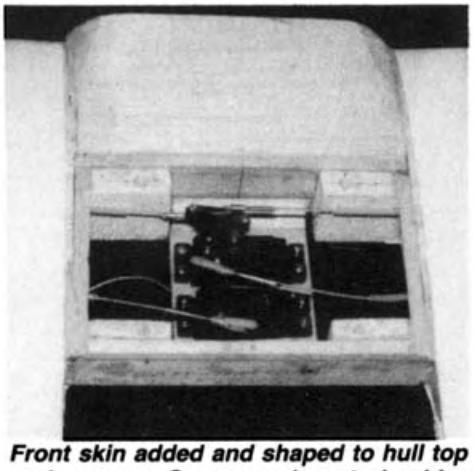
Ailerons, elevators, and rudder are mass-balanced by weights **ahead** of the hinges to balance the surface **on** the hinge line. The ailerons use 1/8"dia., lead wire ahead of the spar; elevators and rudder use 1/8" lead wire in the shielded horns. The Seagull III can achieve very high speeds diving, and these weights help prevent potentially disastrous flutter.

Control Surface Hinging

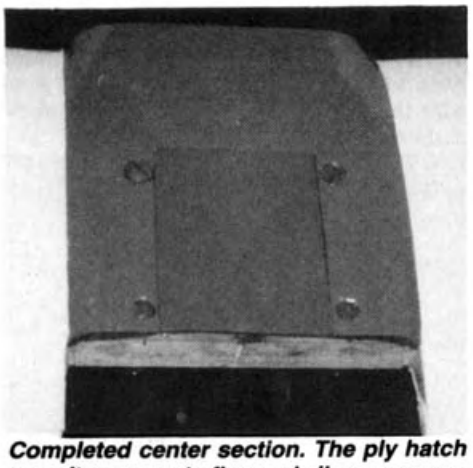
Ailerons, elevators, and rudder are double MonoKote hinged as shown on Plan Sheet #2. This method has been used on at least ten recent models with no problems and the hinge also forms a gap seal increasing control surface effectiveness.

Landing Gear

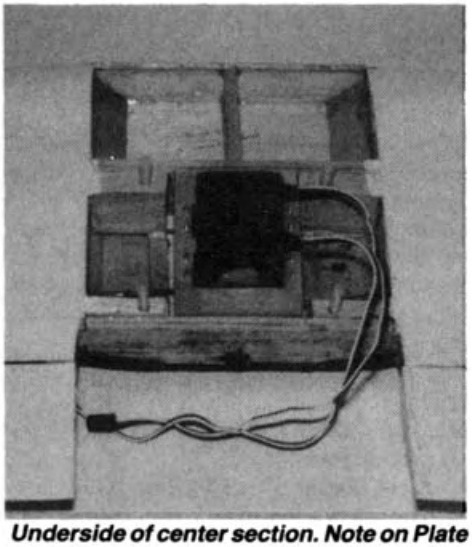
This is designed for easy installation if



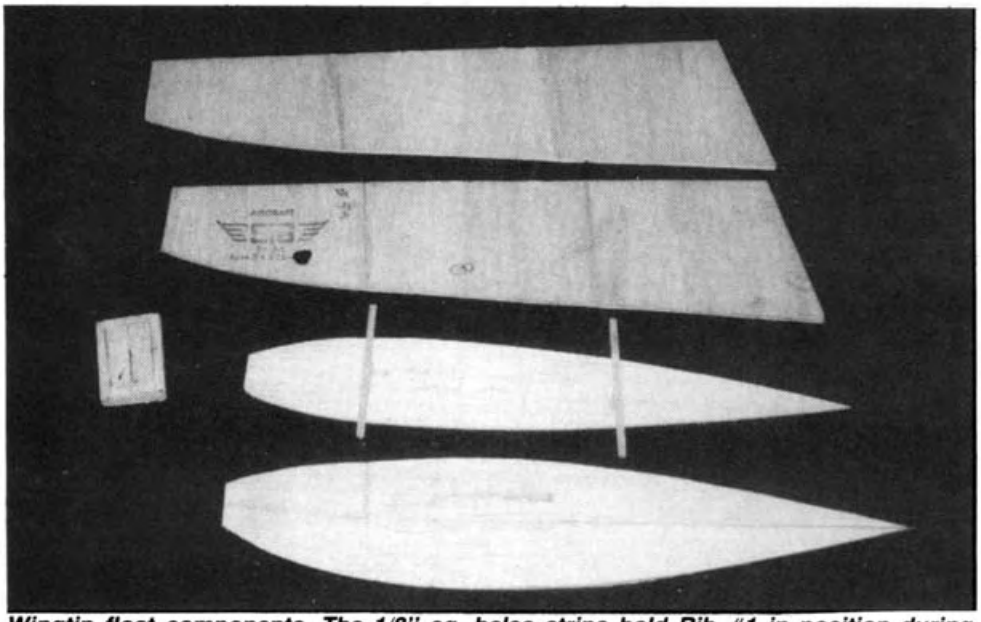
Front skin added and shaped to hull top and corners. Servos and control cables have been installed. Note "double-deck" aileron horn.



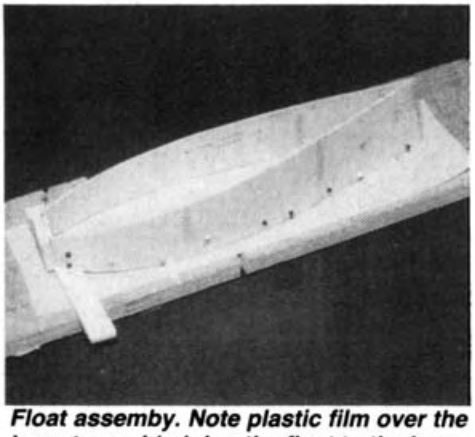
Completed center section. The ply hatch permits access to flap and aileron servos.



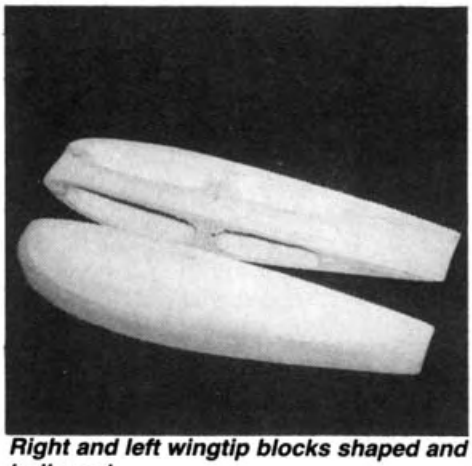
Underside of center section. Note on Plate II of the drawings, the 1/64" ply stiffeners, on the underside of the top skin, joining skin and bass wood slot lip. These prevent the lip from curling from the pull of the covering material.



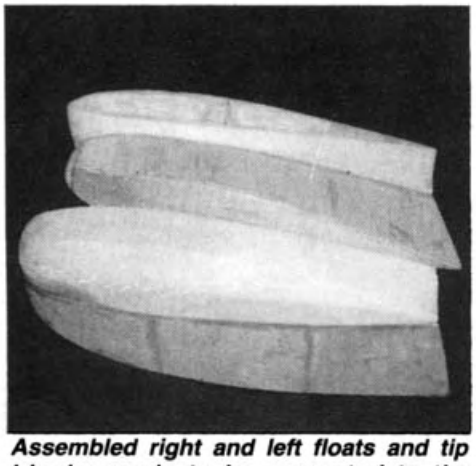
Wingtip float components. The 1/8" sq. balsa strips hold Rib #1 in position during assembly only. The lower Rib #2 is pre-bent as shown using liquid ammonia to soften the balsa.



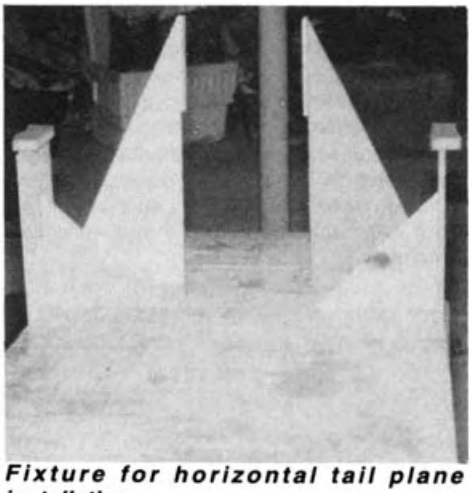
Float assemby. Note plastic film over the base to avoid gluing the float to the base. Only Rib #1 needs to be added.



Right and left wingtip blocks shaped and hollowed.



Assembled right and left floats and tip blocks ready to be cemented to the wing-ends.



Fixture for horizontal tail plane installation.

land flying is to be done. Bend the legs from 5/32" dia., music wire as shown on the plane. Add the balsa and ply fairings. A slight bend in the vertical portion of the nose gear will hold it in its socket. Do not omit the tether, it will prevent nose wheel loss from engine vibration in flight. It has happened!

The main gear is retained in its socket by a 6.32 bolt with a 1/32" brass wing soldered in the slot.

Receiver And Servo Installation

The unusual features of this installation are:

(1) The "double-decked" aileron servo horn shown on Plan Sheet #2, provides the aileron differential.

(2) Use of Futaba Horn "E" on the flap servo to provide the throw to fully lower the flaps.

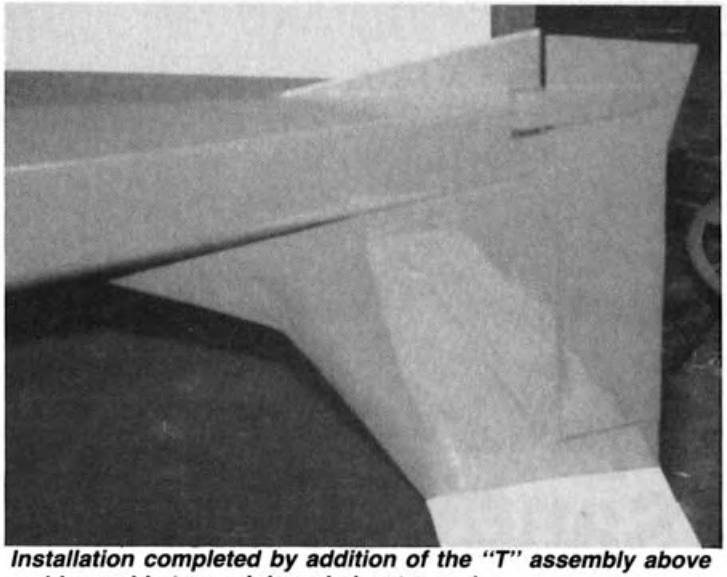
(3) The engine servo and onboard glo plug battery and holder are mounted on plywood which can be lifted to permit access to the fuel tank and tubing. Plan Sheet #1 provides the onboard glo plug heating system wiring diagram.

(4) The special engine servo horn and cam for actuating the micro-switch is cut from Horn "C". Note the small lever arm retaining clip.

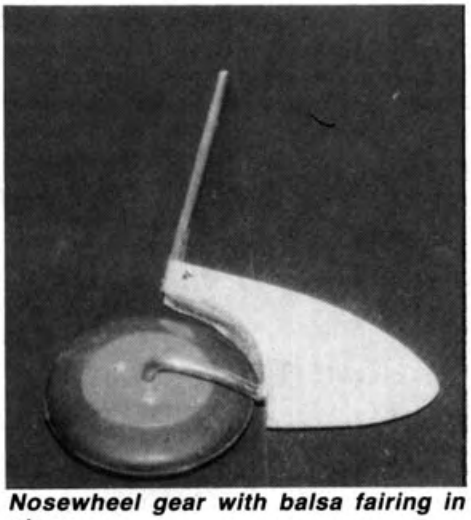
(5) CA clevises directly to the Sullivan steel cable at control surface ends — and

continued on page 204

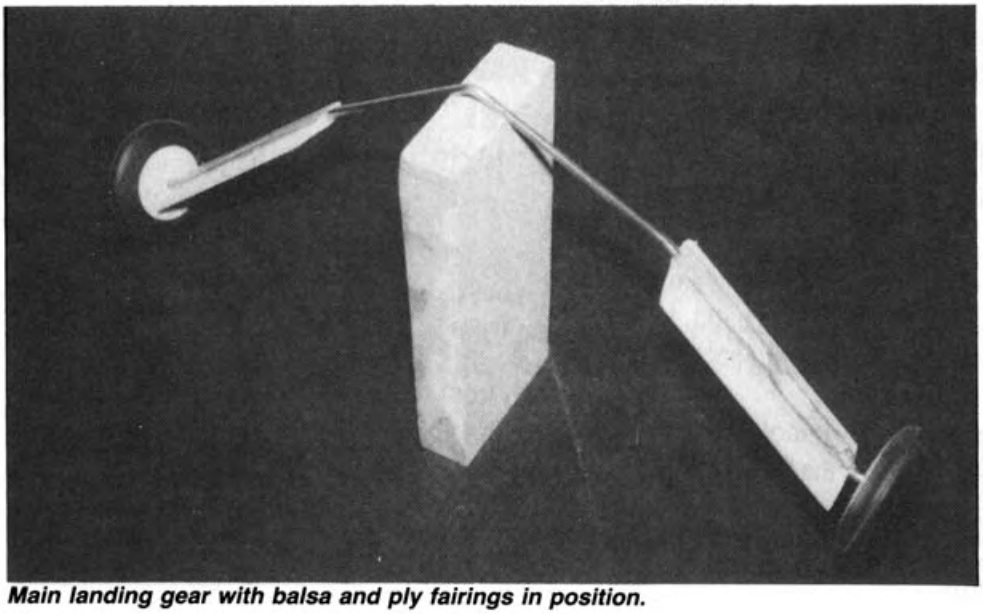
Wing and hull inverted in fixture so that the fin top rests on horizontal tail plane. Note alignment lines on fixture base; bare balsa at this joint and that clevis and elevator horn are linked. Epoxy liberally and allow to set firmly.



Installation completed by addition of the "T" assembly above rudder and between inboard elevator ends.



Nosewheel gear with balsa fairing in place.



Main landing gear with balsa and ply fairings in position.

continued from page 200/192

into the threaded brass couplers at the servo ends. Add servo end clevises.

Covering And Painting

MonoKote was used to cover the Seagull III. Cover the nacelle and hull separate — before installing the nacelle in the hull. On hull and wingtip floats, overlap the MonoKote by 1/4'' to avoid leaks. Flaps are covered separately — ailerons, elevators, and rudder are covered in the hinging process along with their parent surfaces. Wingtips and floats are covered as part of the wing covering.

Epoxy paint was used on the cowling; wing hatch cover; skeg and water rudder; exposed control horns; flap support and pivot ribs; landing gear leg fairings and wheel hubs. Clear dope the exposed balsa on the wing underside at the flaps.

Final Assembly

Flap installation: Using the flap alignment gauges shown on Plan Sheet #2, position the flaps with care. Drill the 3/32'' dia., pivot holes in the pivot ribs, using those in the support ribs as a drill guide. Remove the flaps, enlarge the pivot rib holes to 1/8'' dia., and insert the 1/8'' O.D., brass tube bushings. Reinstall the flaps — insert the pivot pins and connect the cable clevis to the flap horn. Check for free movement. A dab of cement on each side of the flap supports will hold the pivot pins in place.

Nacelle Installations

Slide the pylon into the hull — cementing liberally, after connecting the engine servo wiring to the receiver. An extension cable is needed.

Horizontal Tail Plane Installation

Attach the elevator cable clevis to the elevator horn and epoxy the horizontal tail plane in position on the fin, after careful alignment. Do not omit the (2) 3/16'' dia., dowels reinforcing this joint. Add the ''T'' section, in 1/16'' balsa sheet, closing the gap at the rudder top and between the inboard elevator ends.

Engine Starting

The Seagull III's engine must be started inverted, priming is done by squirting a few drops of fuel into the cylinder via the 3/32'' dia., holes in muffler and cowling. A plastic lighter fluid container, with a nozzle that rotates to seal, makes a squeeze bottle. 1/16 O.D., brass tubing inserted in the nozzle and extending 1'' beyond makes priming easy, without cowl removal.

Turn the prop by hand after priming. If unusual resistance is felt, **do not** force the prop. Tip the model on its right wingtip so that the cylinder is inclined, permitting the excess fuel to drain into the muffler.

Return the model upright, flip the prop to be sure of **no** hydraulic lock, insert the external plug into the jack on the nacelle's side and apply your electric starter.

Flying

Performance of Seagull III, exceeded its designer's expectations.

Take-offs from either land or water, the big slotted flaps half extended are under 25 feet.

Due to the model's low drag, the glide is very flat. Landings, flaps up, can run out of runway. Full flap extension (after throttling back) is mandatory for slow, steep approaches and gentle, nose high landings.

Level flight speed vary from 25 mph, flaps down, to 75 mph, flaps up.

Due to the NASA droop, aileron control is effective at very high angles of attack, yet the aircraft is highly aerobatic.

Surprisingly, despite the high thrust line, there is little pitch change with changes in rpm. Also, little pitching when flaps are lowered after throttling back.

Enjoy this model's flying. It's pure fun! □