CORKY II

BY TED STRADER

● Corky II is an enlarged version of a single channel .020 powered seaplane I designed in 1972 which was never intended to be flown from the water! Being an avid seaplane fancier, I decided to use this configuration and simply let it land on the grass — after all, sailplanes do it all the time.

After a couple of seasons of hand launching from our hay field, the urge became great enough to head for the lake. The hull had been designed for water, even though the original intent was to keep dry.

Corky I floated, taxied and, as witnessed on at least a hundred hand-launched flights, flew like a greased bullet with incredible stability. Its 17 ounce flying weight didn't prevent it from catching four or five thermals and almost becoming lost. It did have one minor flaw . . . it didn't want to ROW! The step was positioned too far aft of the CG for the ship to rotate without an elevator.

On the first day of this past September, I decided to revamp the design for multi in time for the Brimfield, Massachusetts water meet September 12th.

A half-A sport seaplane designed for two or three channels. A Cox .049 with Ace throttle sleeve provides plenty of power and idle for taxiing.

In eleven days, Corky II became a reality; larger, using three channels with one of them operating an Ace sleeve throttle on a Cox Medallion .049.

When my son Eric and I arrived at Brimfield, the only thing we'd had time to check was the throttle control. Corky II had not been test flown, glided or even floated. However, five flights were made that day — all hand launched as the wind was gusty and the water quite choppy.

The next weekend we went to a local hydro meet at Round Lake, N.Y., but, due to equipment problems, failed to really set the world on its ear! By the end of the day, the ROW scoreboard read: Water 7, Corky II 0; and warm weather fast disappearing.

In the hope that a few good days yet remained, I installed some newer equipment which checked out well and waited for the weekend. Saturday was almost perfect so we headed back to the lake. The water had a slight ripple, it was warm, there wasn't a boat in sight, and my chief pilot made five near-perfect ROW's. The following Wednesday we went back again and, by the time we had taken advantage of that day and the following Saturday and Sunday, Corky II had completed 25 ROW flights, many of which were captured on film in the shots presented here. What we refuse to admit is the two times we completely missed the mile-long lake and landed on the beach; the time it ran aground on a sand bar; and the couple of times it was taxied into our row boat. These are just ugly rumors with no basis in fact.

The hull of the Corky progresses from a "V" to an inverted "V", or cathedral configuration, which, in the case of this model, is very easily formed and enhances water handling. On the step, a tunnel allows air to help break the vacuum.

We have not felt the need for a water

rudder as the model is quite maneuverable on low power. On high power — during take-off — accidental application of a water rudder could swamp a wing pontoon and flip the plane. During take-off, your concentration is on elevator control to get the plane up on the step and then lifting free of the water. The cathedral points, at the step, become very effective fixed rudders which keep Corky on a straight heading. It's possible to make minor heading corrections on high speed; however, I noticed that I didn't have to worry about over-controlling the air rudder no matter how much I gave it.

Two different engines have been used — a Cox Medallion .049 and a TD .049 with excellent results. Though it hasn't been tried, the new Black Widow .049 seems to have the power needed, especially if the water isn't too choppy. A Baby Bee .049 would be more than ample to fly Corky if you decide to hand launch rather than ROW.

Both models we are currently flying use standard equipment and four 450 mah pencell nicad battery packs. The first Corky II uses three servos of the D & R, Ace Commander, Kraft 12, or similar type. The second Corky II is flying under the influence of an EK LRB (brick). Both planes weigh 22.5 ounces which gives them a wing loading of 13.7 ounces per square foot based upon an effective wing area (total plan area minus the fuselage rest area) of 235.8 square inches.

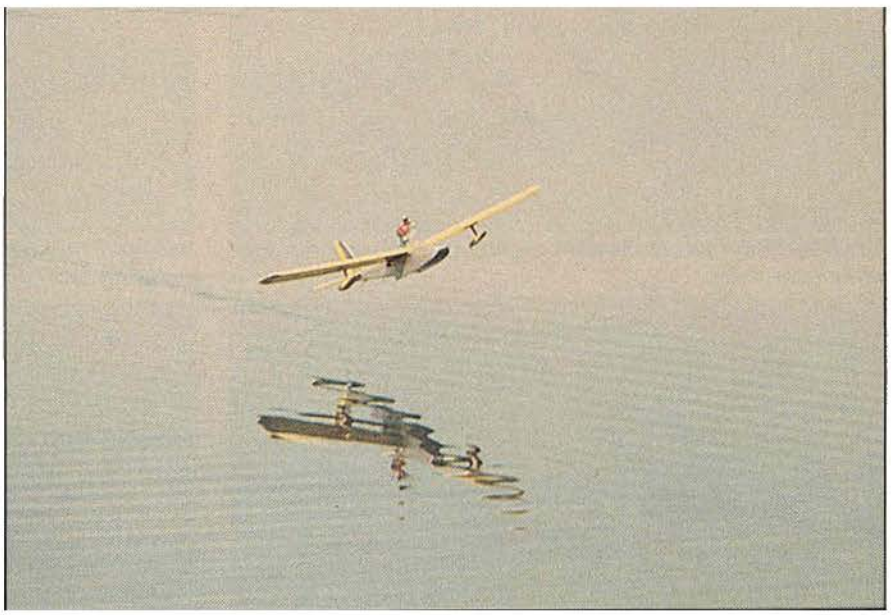
CONSTRUCTION

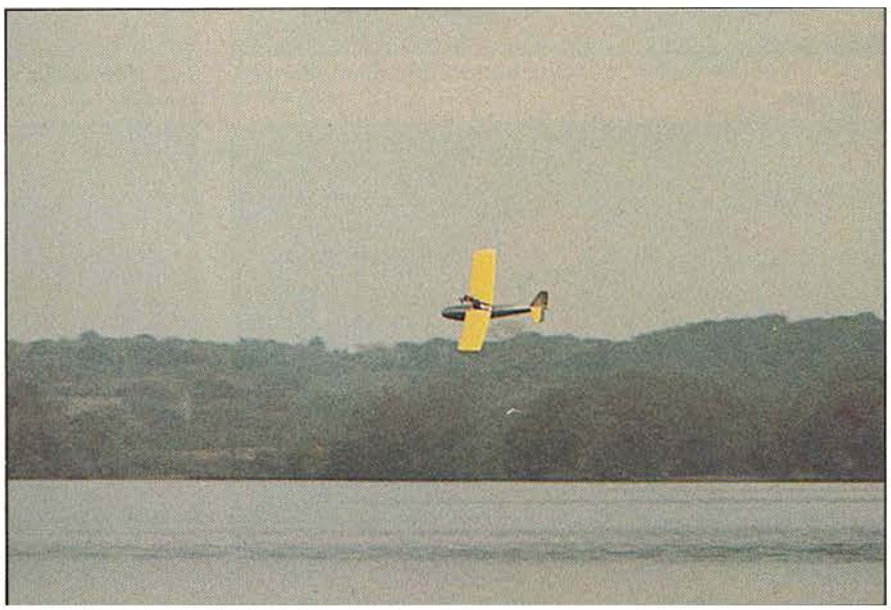
Fuselage: Begin by cutting out two fuselage sides and the doublers. Note the slots in the fuselage sides to accommodate the notches on the crutch/servo tray and on bulkheads 6 and 7. Cement the doublers in place and check the sides to be sure they match.

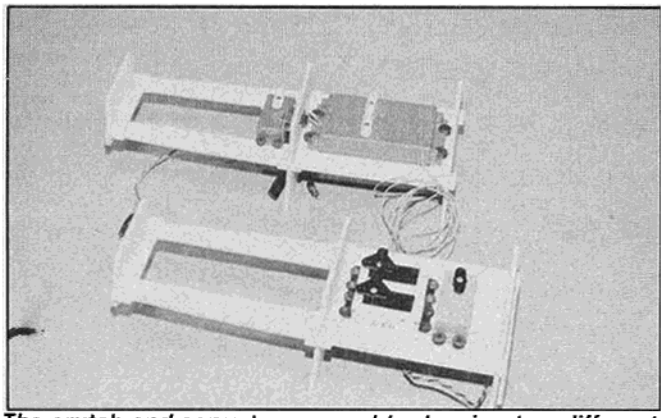
Cut and alter the 1/8" ply crutch/servo tray to accept the radio equipment you will use. Cut out bulkheads 1, 2 and 3 at this time. Make any alterations to 2 and 3 to facilitate wires and an internal switch mount if you plan on one. Bulkhead 3 will have to be altered to accept the type pushrod you may decide to use. Once this has been done, fit these bulkheads onto the crutch/servo trav to see how they fit.

When you are satisfied with the fit, lightly cement 1, 2 and 3 to the crutch and, when dry, cement the fuselage sides to this assembly. Masking tape works well for us in holding the parts together until dry. Before the forward portion has dried thoroughly, pull the fuselage sides together at the tail and check for alignment. This is the time to make minor corrections in case the assembly has shifted during construction.

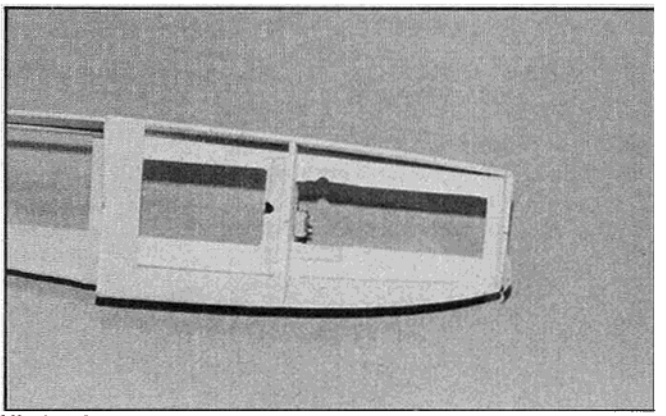
Bulkheads 4, 5, 6 and 7 can be cut out, altered as needed for your equipment, and cemented in place. Again, masking tape can be used to hold the parts in place while the cement sets. Note that a



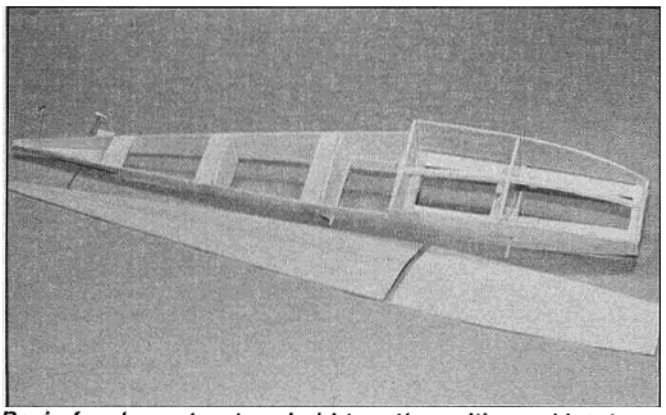




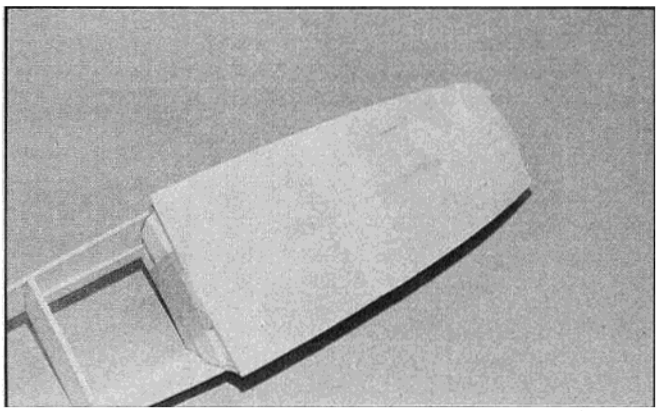
The crutch and servo tray assembly showing two different radio installations.



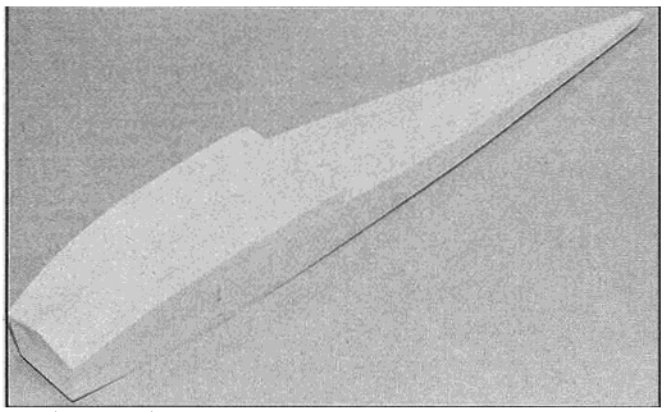
View of crutch and servo tray assembly glued between fuselage sides.



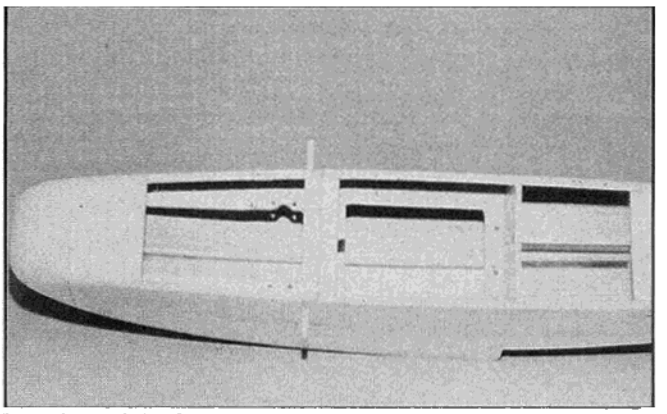
Basic fuselage structure held together with masking tape while glue dries.



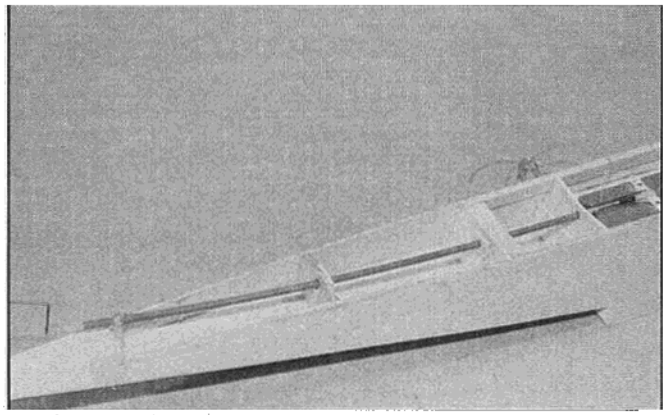
Forward hull planking is glued in place and held with masking tape until dry.



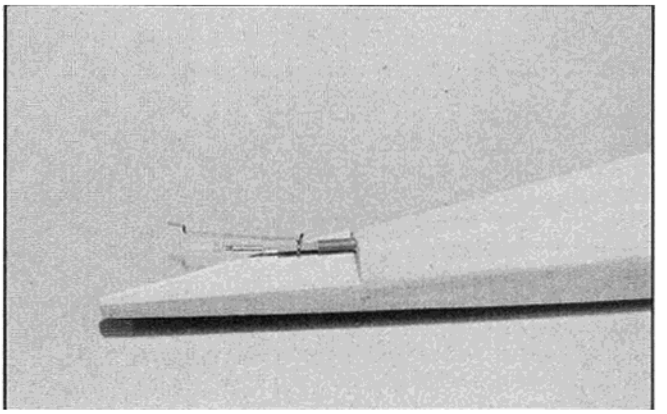
In this photo the entire fuselage bottom has been planked with balsa.



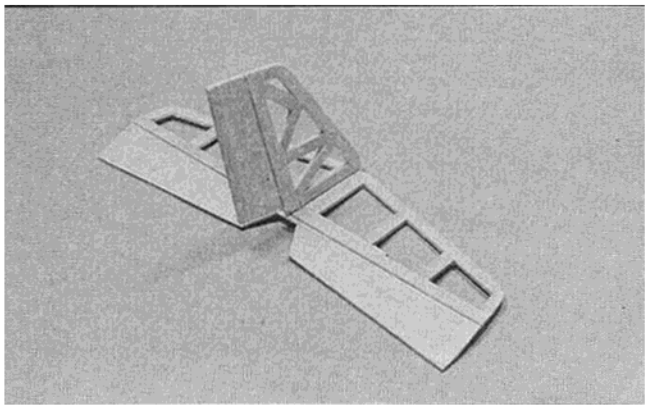
Top view of the forward hull section showing the servo tray details.



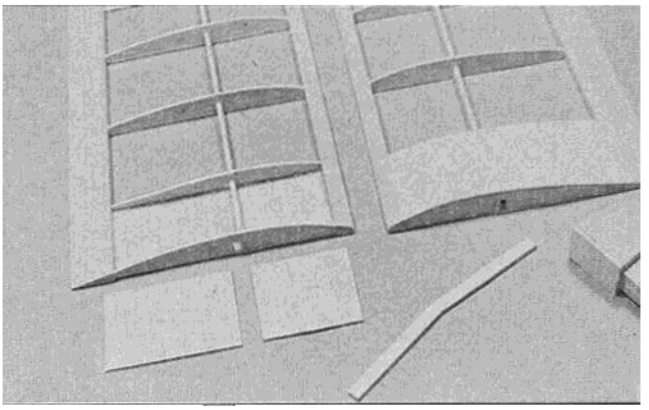
Detail view of the pushrod routing. See text for additional notes.



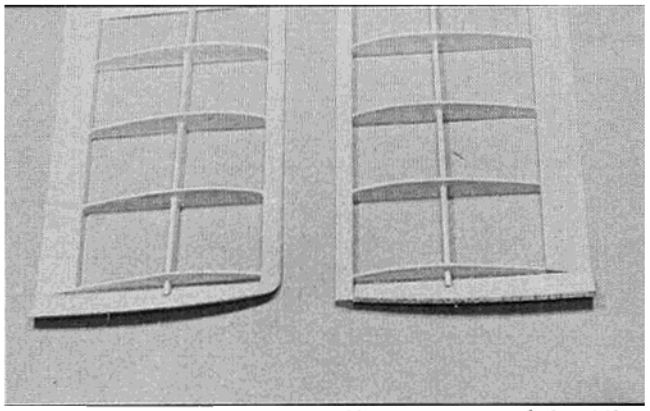
Tail view of special cable plus nylon in nylon pushrod.



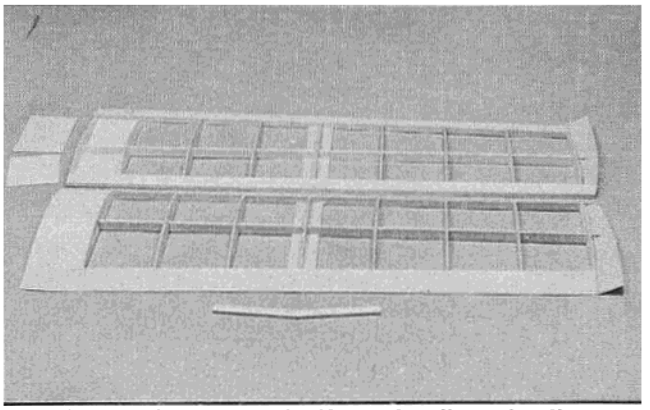
The Corky II empennage assembly is easy and straight-forward.



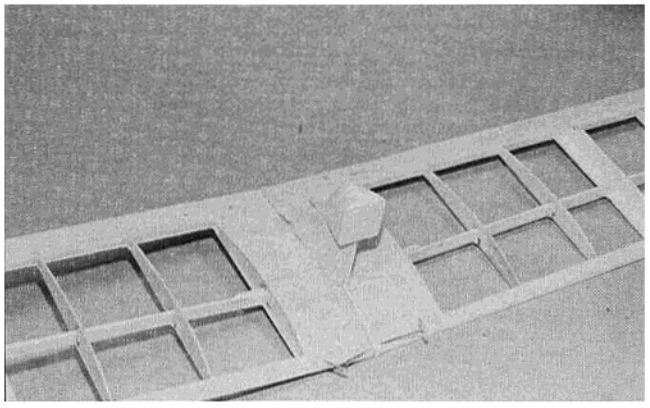
The wing center section showing the top and bottom sheeting and ply dihedral brace.



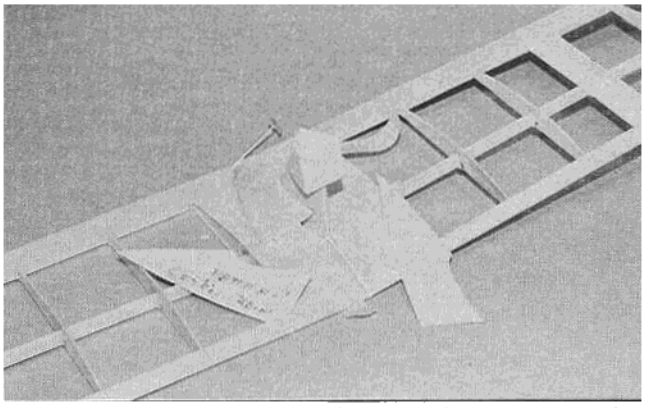
Detail of wing tip construction. Note upsweep of sheet tips.



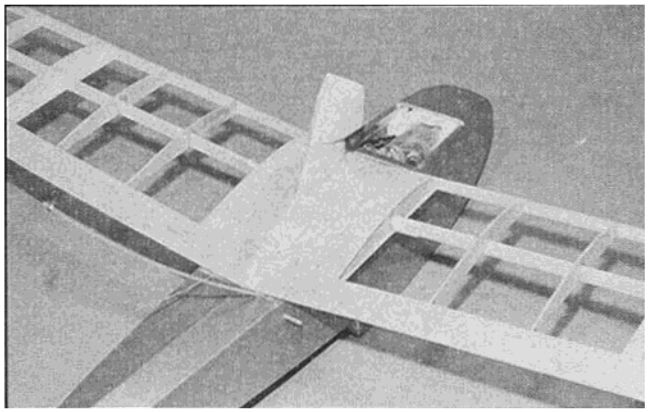
Overall view of wing panels. Note wing float sheeting near mid-wing.



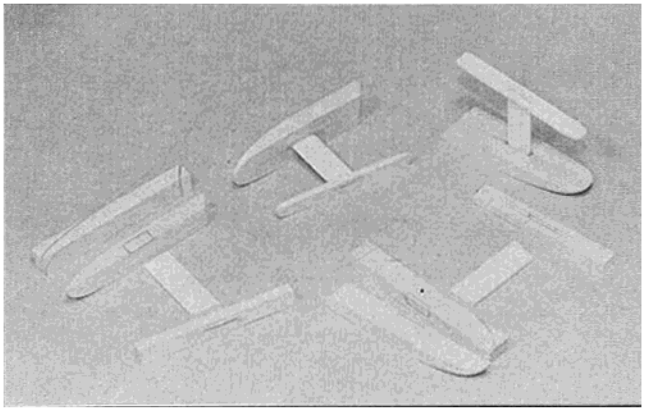
Wing is joined with dihedral brace and pylon mount for .049 engine.



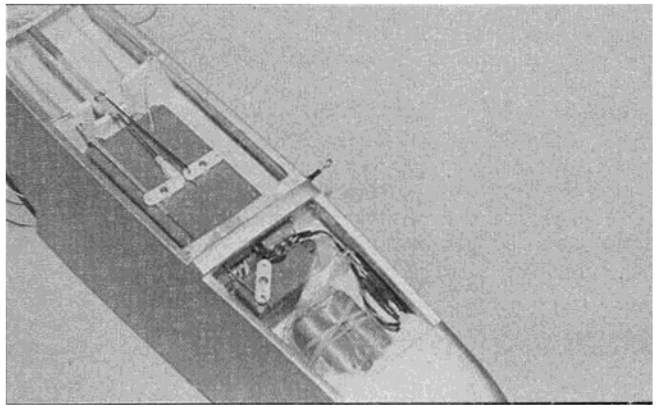
The cabin sheeting is cut to fit around the pylon, using templates.



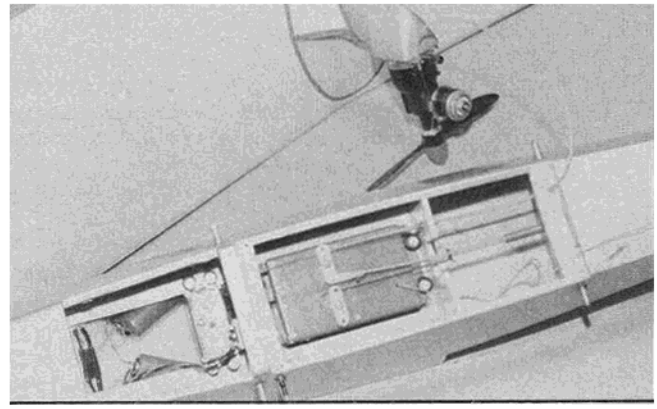
The completed wing with cabin sheeting fitting neatly to wing contour and around pylon.



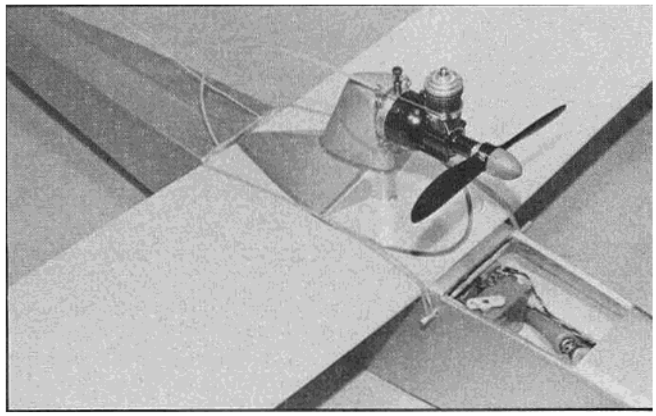
The tip floats shown before shaping and after assembly.



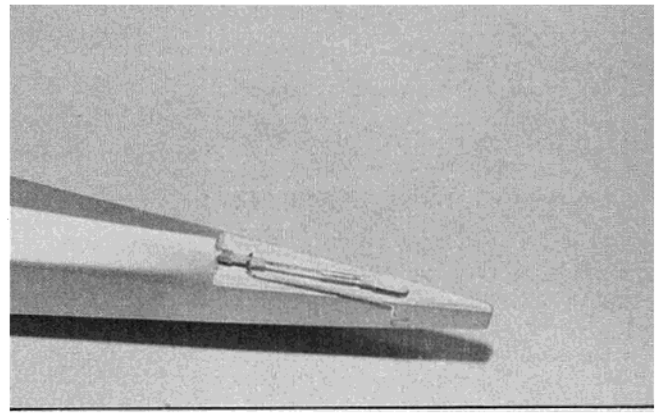
The completed radio installation using a brick plus throttle servo.



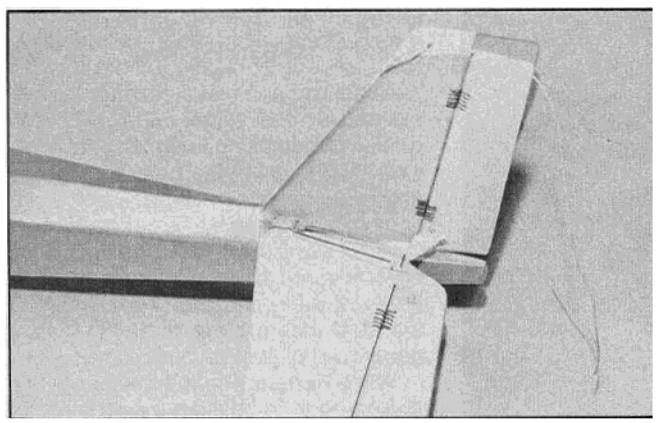
Wing removed to show throttle cable through tubing to Ace throttle.



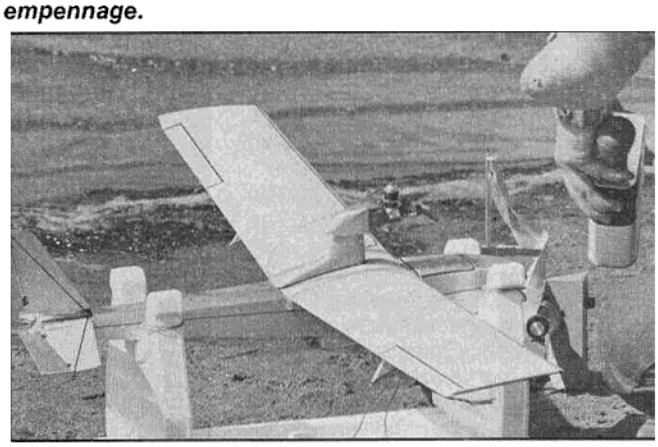
Wing in place, forward hatch removed. Note cabin windshield and throttle cable.



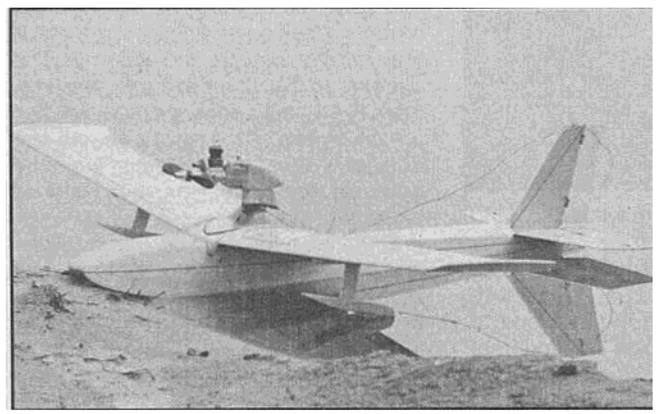
Another view of the unique pushrod linkage to the empennage.



Empennage in place with linkages attached to rudder and elevator control horns.



The completed Corky II rests on its Robart Stand at the lake side.



The Corky II rests in the water prior to its maiden flight.

And she's up and away - - - and easy-to-build, economical to fly amphibian.

small triangular bulkhead is inserted at the tip of the fuselage. The stab rest can be cemented in place at this time.

Waterproof the lower inside portion of the fuselage sides and crutch in the cabin and hatch area. Later, when the bottom has been installed, the inside of it, the upper inside of the cabin and hatch area and the section between 3-4 and 5 are waterproofed. We use Hobbypoxy II glue, slightly heated to increase its fluidity, then painted on with an old brush. The keel is installed next and this portion of construction set aside to cure.

Installing the forward bottom hull pieces is the only tricky part. However, if done carefully, this step should offer no real problem. Arrange the 1/8" sheet pieces for the forward hull section as shown on the plans. Cement them together and allow to dry thoroughly. When dry, sand the seams on a flat surface prior to installing the parts on the fuselage. Sand the keel (center) line to fit along the keel of the fuselage. When you are sure the two pieces fit properly along their keel line, the chine outline can be checked and cut, allowing an ample amount of wood to be sanded away after the parts have dried. Hold these covering pieces in place with masking tape until the assembly is dry.

The rear hull pieces are quite simple to install. Sand and fit the pieces along their center (keel) line until you are satisfied they are ready. Tape the two pieces together at the keel line, apply cement there and at all points of the fuselage where these sheets will make contact. Make sure the keel line is running true along the center of the fuselage and then tape down until the parts are secure.

Install your pushrods in place prior to adding the 1/16" rear top sheeting. The concentric control hook-up shown is an arrangement I have been using for sometime with excellent results. On the Corky, it means one less fuselage hole to keep watertight. Essentially, our "Unirod" hook-up is a flexible cable controlling the rudder, and the sheath with wires attached at each end controlling the elevator. Both of these move back and forth within an outer plastic tube. You can fashion yours from Sullivan Gold'N-Rod material. Squeeze some petroleum jelly or light grease into the tubes as you assemble the parts. This will spread it down through the tubes and help keep water out.

The rear top sheeting (turtle deck), aft of the wing, is of two pieces and is installed similar to the bottom hull sheets. Tape the two sheets together along the center line, check them in place to see how they fit and, if you are satisfied, cement them in place. I placed a small amount of silicone rubber around the main control tube just inside where it exits bulkhead 7. There was just enough excess that it was pushed down around the tube as the sheets were installed.

The next step is to add the front top 1/8" sheets at the nose, including the removable hatch. Cement the strip at bulkhead 2, position the piece which will later be used as the hatch (do not cement it), and then cement the front piece in place. Hold all with tape until dry. When they are secure enough for sanding, remove the cross tapes. Run a tape lengthwise from the front bulkhead over all three sheet pieces and down bulkhead 2. This will keep the uncemented hatch piece from shifting while you sand the three pieces to shape. The nose block of soft balsa is installed next and, when dry, cut down close to size with rough sandpaper — then smoothed to outline with fine paper. By sanding from the fuselage outline forward with fine sandpaper, you should have no trouble blending the five edges into smooth flowing lines.

CORKY II
Designed By: Ted Strader

TYPE AIRCRAFT
1/2A Seaplane
WINGSPAN
41 Inches
WING CHORD
6⅛" (Avg.)
TOTAL WING AREA
235.8 Square Inches
WING LOCATION
Shoulder Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Swept T.E.
DIHEDRAL, EACH TIP
2 Inches
O.A. FUSELAGE LENGTH
26½ Inches
RADIO COMPARTMENT AREA
(L) 8¼" X (W) 3" X (H) 2½"
STABILIZER SPAN
12¾ Inches
STABILIZER CHORD (incl. elev.)
3⅜" (Avg.)
STABILIZER AREA
43 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Mid Fuselage
VERTICAL FIN HEIGHT
5⅛ Inches
VERTICAL FIN WIDTH (incl. rudder)
3⅜" (Avg.)
REC. ENGINE SIZE
.049 — .051 Cu. In.
FUEL TANK SIZE
Tank Mount
LANDING GEAR
NA
REC. NO. OF CHANNELS
2 — 3
CONTROL FUNCTIONS
Rudder, Elevator (Optional Throttle)
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa and Ply
Wing	Balsa, Spruce & Ply
Empennage	Balsa
Wt. Ready-To-Fly	22.5 Oz. w/3 servos
Wing Loading	13.7 Oz/Sq. Ft.

Two 3/8" wide strips of 1/8" plywood are installed in the cabin area at bulkheads 2 and 5 to serve as ledges for later use in waterproofing this area. Note they are cracked to conform to the wing dihedral angle.

Sand the entire fuselage smooth in preparation for covering. I usually temporarily install the R/C gear . . . at least the servo and pushrod connections at this point to be sure the parts are going to fit. Hatch dowels can be cemented to the hatch cover and the wing hold-down dowels placed in position but not cemented until after the model has been covered. If you plan on actuating an internal switch with an external pushrod, this is the time to do the fitting and cutting. The actual installation should occur after the model has been covered.

Stabilizer/Fin Assembly: The fin and stabilizer are constructed in a routine manner of 1/8" x 5/16" strips, reinforced by 1/8" hardwood dowels as shown. These simple additions greatly increase the strength of the entire tail assembly. The rudder and elevators are 1/8" sheet with the elevators joined over the plans by a short length of 1/8" dowel.

Fit the fin to the stabilizer and then fit this assembly to the fuselage to be certain the parts line up and the dowel extension in the fin fits properly through the stabilizer and on into a hole in the stabilizer rest on the fuselage. Do not cement in place at this time.

On models of this size, I prefer to use heavy thread for hinges; however, any of the presently acceptable and available methods will work adequately. I cover the stabilizer and elevators prior to hinging and do the same with the fin and rudder. When using Polymer coverings, it's easier to cover the parts individually and assemble them later. Then I assemble the hinged tail pieces and mount them as a unit to the fuselage after it has been covered. Naturally, you must leave areas of the underside of the stab and the stab mount bare of covering so a good solid glue joint can be made.

Wing Panels: Pin the main spar and trailing edge in position over the plans. Cut and fit the bottom 1/16" sheeting at ribs 1 and 2, plus the sheeting at rib 5 which is to be used as the wing pontoon mounts. Position and cement the ribs in their proper places and slant rib 1 to conform to the dihedral angle. Next, cement the leading edge in place and then the tip pieces. The tips are an anti-stall design which are very simple, attractive and help make this diminutive water rat extremely stable.

Once the panels are dry, remove them and check one against the other to be sure they match and then sand each into its final form. Check then with the dihedral brace to see how well they join at the center. Permanently cement the dihedral brace into one of the panels. Allow a space at the center of the brace to accommodate the 1/8" thickness of the

power pod plywood core piece.

Power Pod/Cabin: The power pod consists of 6 pieces: one 1/8" plywood core piece, two 1/4" sheet sides, two 1/4" sheet cheeks, and one 1/8" plywood firewall. The unit is constructed as a sandwich and sanded to a streamline shape prior to being permanently attached between the wing halves. I've found it easier to apply any filler coat and do the finish sanding while it's still a separate piece. The power pod unit is then permanently attached to the wing panel with the dihedral brace and the other panel then attached to it. Prop up the wings with blocks to effect a 2" dihedral under each tip. Check to be certain the pod is equiangluar between the two wing panels. In other words, it "ain't" listin' to one side more than the other!

Constructing a cabin on to the pod is a builder's option; however, I think it adds to the realism of the model. Note the grain direction of the cabin side sheets. This allows the balsa pieces to wrap around the pylon. The pattern shown is identical to our two Corky models. However, you will probably need to do a little cutting and fitting to accommodate the final sanding and shaping job you have done on your pod. The two triangular bulkheads will assist in mounting the cabin sides.

The windscreen is another cutting and fitting job which will vary slightly from the outline shown. Ours is cemented only along the two straight edges which join at the cabin. The curved edges are held in place with pin stripe tape. This, of course, is done after the wings have been covered and the cabin given its finish.

Wing Pontoons: These are constructed from balsa and spruce, and while simplistic in design and construction, have worked flawlessly. Their position gives maximum bouyancy while the plane is at rest, yet are completely out of the water as the hull approaches a take-off attitude. At this point, the cathedral points of the hull create their own bouyant stability and the pontoons are not needed.

The base of each is fashioned of two 1/4" strips notched out for the spruce strut. The hull or pontoon portions are made of two strips of 1/2" x 5/8" balsa, rounded slightly in front and sanded to a gentle bow outline as shown. Note that the 1/8" x 3/4" spruce strut does not pass completely through the pontoon.

These units may be permanently attached to the wings; however, I prefer to mount mine with thin double stick foam tape which gives them a bit of flexibility if a landing happens to be somewhat less than perfect!

Equipment Installation: If you decide to throttle your engine, be sure the plastic tube which houses the throttle cable is anchored securely at each end as shown to prevent it from shifting as the cable slides back and forth during throttle changes. Just a slight movement of the tube can cut down on the throttle movement and change the engine performance.

Brick users will probably mount the throttle servo just ahead of bulkhead 2 as shown by the dashed lines on the plan top view. The throttle cable tube will have to extend almost to bulkhead 2. Only the cable should actually pass through a hole (approximately 3/16" diameter) in bulkhead 2. The external loop of the throttle cable and tube is about optimum and recommended. A larger loop would be unnecessary; anything much smaller would tend to bind.

The plans show the outline of a brick in the position we used on the second Corky II. The three servos of a regular installation are also shown with their linkages in place. Rudder and elevator hook-up would be the same if you used a brick or individual servos.

If the "Unirod" hook-up confuses you, spend a few minutes examining the plans and following the linkages from each servo to the surface they control. The stranded cable controls the rudder. The tube it passes through gives the cable its overall support and also actuates the elevator by the simple addition of the two short lengths of .045" wire shown at each end. These wires each have a loop bent into one end which fits tightly over the tube. The other end of each wire has an offset bend which loops into the control horn on the elevator and the output arm of the servo respectively. A snug fit of the wire loop on the plastic tube allows for adjustment and still holds firmly for extreme control. However, if you prefer, you may apply a drop of epoxy to the loop for your own peace of mind.

Servo Hook-up: One of the two servos will travel in the right direction to give you rudder control corresponding with the correct stick movement. If the other servo doesn't travel in the right direction for the wire to be attached as shown and operate the elevator with the correct stick movement, simply bend the wire so it can be attached to the opposite end of the servo output arm. Make sure the linkages work freely.

Covering: Both of our models are covered with Solarfilm and have remained quite dry. Any of the plastic coverings will work fine, as will silk. This a personal preference; however, cover your model with care and an eye toward keeping it as watertight as possible.

Waterproofing: To waterproof the hatch, apply a little petroleum jelly to the outer edge of the hatch and a thin bead of silicone rubber to the hatch opening. A rubber band looped over the forward wing dowel will keep it in place. The cabin area under the wing is covered with a thin sheet of polyethylene such as the backing from MonoKote or Solarfilm, held in place by a thin strip of double sided sticky tape (3M or similar) applied completely around the opening. I then apply a strip of one sided sticky foam tape on top of this for the wing to rest upon.

Balance and Flying: It is important that the model balances on the wing spar. A tail heavy plane (any plane) can be difficult to handle and have a tendency to stall. Excessive nose-heaviness, while not as critical as tail-heaviness, will have a tendency to cause your model to plow into the water as you increase throttle for take-off.

Take-off, from any surface, requires more power than flight. Water is the most difficult, which is why so much attention is given to hull design and why you will need to practice a routine you may never have found necessary before.

During take-off from a slow taxi situation, give up elevator as you gradually increase the throttle to prevent the ship from lurching forward and pushing the nose down into the water. An immediate increase in thrust has more effect on the plane than the elevator which requires sustained forward speed to become effective. As the ship builds up speed, slowly return the elevator to neutral which will allow it to rise up on the step. Once the model is on the step, "play" gently with the slightest bit of up and observe the reaction. As wind and water conditions vary, you may find it will rise off without any elevator control. Other times you may have to "fly" it off.

A Warning: It is possible you may become addicted to water flying. You may also become aware that your Corky II is one of the fastest, most stable, maneuverable and responsive ships in your hangar. We hope so.

Good Luck and Good Flying. □

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