SKID KID

Sue Morey proudly displaying Uncle Ralph's Skid Kid. Photo taken by her husband, Rick Morey.

If you're shy about the strange looking airfoil — don't be. It's a real performer, especially in confined areas.

By Ralph Pearson

Smooth and highly maneuverable, this little airplane excells at "close-in" flying. I refer to those antics performed close to the pilot, or within a confined area. At reduced airspeed the Skid Kid can really perform safely; for example, a horizontal Figure 8 at 5' to 10' altitude, or it can pick-off a few daisies in the corner of the field. How about trying a 12" limbo or flying under your transmitter antenna?

Of course you can't do this on a crowded field --- safety first. At our own field we stand aside and watch as our top pilot puts the "Kid" through such gyrations.

You don't need to be a top pilot to enjoy this airplane, or feel limited to the perimeter of the field or runway. My original, at 20 ounces and powered by a Cox. 049 Golden Bee R/C (half the power of the Tee Dee), can outspeed most trainer types.

To get the most pleasure from the "Kid," throttle control is a must. Cox throttles (sleeve type) really do work well and are trouble-free.

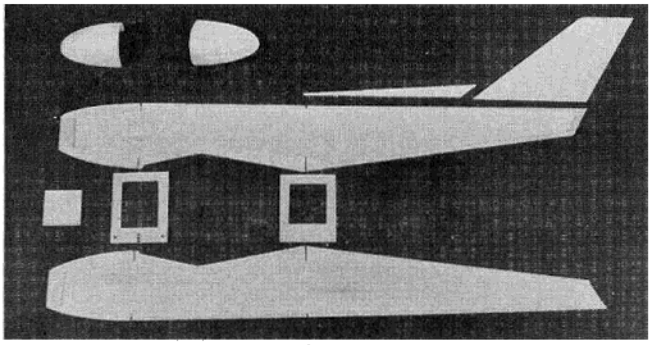
Nothing I've constructed or designed to date can match the effortless performance of the "Skid Kid," so don't be shy about using that strange looking airfoil. More on this airfoil later.

There are two or three places that could cause you extra work and some trouble if not done in proper order, so be sure to study the plans and read the entire construction article before proceeding to build this plane.

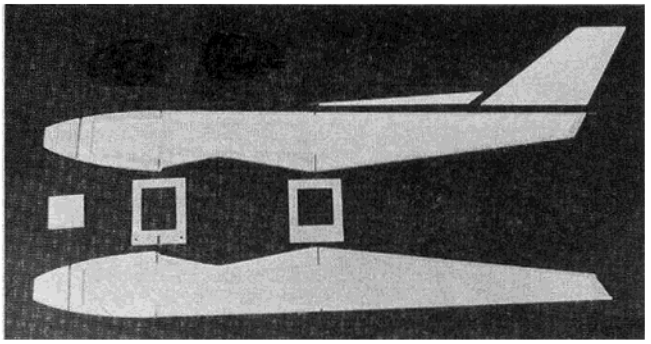
Please don't add braces, gussets, strengtheners, or whatever, to this airplane. Don't ever build a plane to be crash proof. It can't be done. The extra strength you add becomes the extra weight. This leads to a more powerful engine and a larger fuel tank. Now the plane is so heavy it flies poorly and, when it does crash, it hits harder resulting in more damage than normal.

However, you can ad lib in several areas --- always keeping the weight factor in mind.

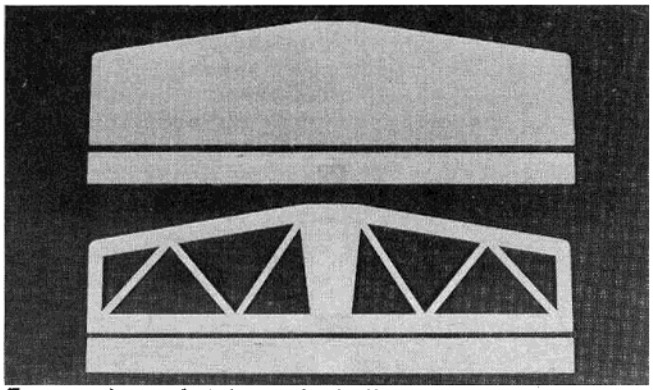
There are three choices of stabilizer



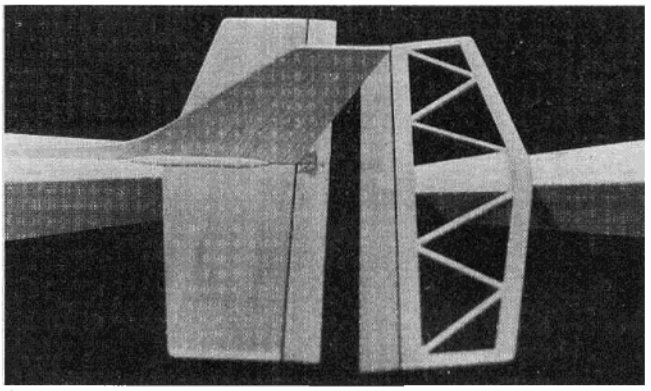
Fuselage parts layout for SK-1.



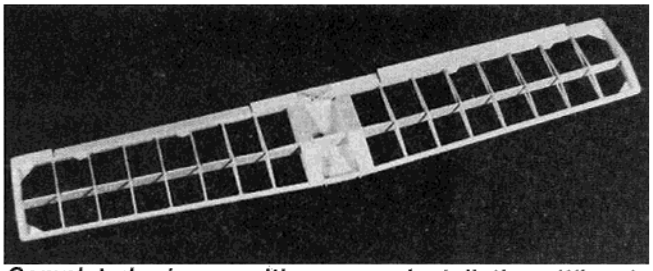
Fuselage parts layout for SK-2.



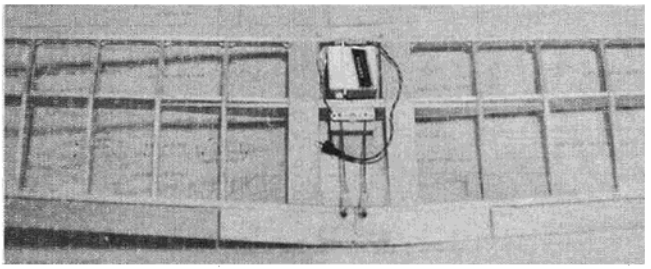
Two versions of stab can be built.



Close-up of tail assembly showing both stabs.



Completed wing awaiting servo installation. Wing is lighter and stronger than sheet rib type.



Aileron servo installed. Note bellcrank arrangement from servo to aileron torque rods.

construction. The original used medium light 3/32" balsa sheet. This is ideal but is difficult to hinge. The "built-up" (1/8" stock) stabilizer, shown on the plans, is more work but is light and easy to hinge. The third choice would be very light 1/8" sheet balsa.

The new Goldberg small "flex point" (RK-4) hinge is very easy to use, but is stiffer than pinned hinges, resulting in higher drain on that little 225 battery pack. Use pinned small Klett (RK-2) on the ailerons at least.

Gold'N-Rods (Pylon-GRF-36) are shown on the plans, but a "made-up" pushrod can be used. Use 3/16" square medium balsa with the ends of your choice. Du-Bro spring thread couplers will be very handy here. The couplers for .047 wire will be ideal for the newer very small servos.

The wing tips can be laminates of 1/8" balsa or 3/16" balsa.

I used basswood for the original dihedral brace, but good basswood is hard to find. Basswood was used for the skid also. You can use two pieces of 1/16" plywood (epoxy together) for the firewall. This can also be done with other 1/8" plywood parts.

CONSTRUCTION

You needn't build the Kid super light, but you can't get careless with heavy wood or gobs of epoxy either. Don't try to hide the wood grain on the painted parts, as this adds weight fast. Choose your wood carefully, using mainly lightweight balsa. The main spar, however, should be cut from straight, hard, very strong stock.

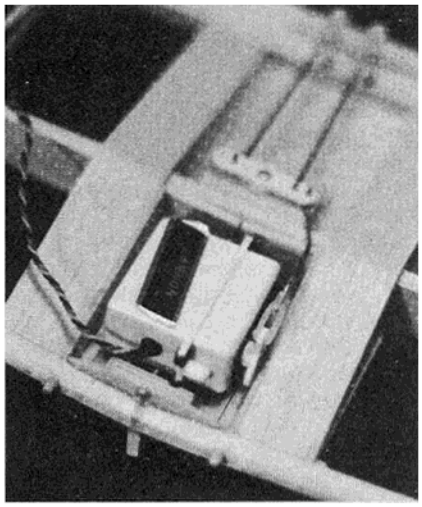
An optional "built-up" spar is included on the plans and should be used with the SK-2 version. Be sure to use 3/32" plywood for the spar brace in this case.

Wing: If you use the "built-up" spar, build this first. An easy way to do this is to add pieces of 1/8" medium balsa (vertical grain) to one strip of 1/8" square spruce. Do this on a covered work surface, making sure the spruce strip is held straight. When this is dry, use a straightedge and cut this assembly down to 9/16" at one end and 11/16" at the other. Now when you add the other 1/8" square spruce strip you will have the proper spar size 13/16" tapered to 11/16". Sand the sides flat. This will help later when the spar brace is added.

I highly recommend Ambroid, Sigment, or similar for the first four steps in the wing construction. Titebond, or similar, is a second choice.

Construction of this type wing is easier than describing the procedure. It also takes longer to make a set of ribs (sandwich style) than to build one half of the "stick type" wing. Also, for a bonus, the wing will be lighter and will be less susceptible to bench rash. One can really manhandle this wing while sanding, etc.

Protect the plans with kitchen wrap,



Close-up of aileron servo. Note servo board hold down screw in front.

film backing, etc. Make sure the trailing edge stock is a full 1/4" at the high side --- some are not. Add a piece of 1/8" stock (at the front edge) if this is the case.

Tack glue (5-6 places) the trailing edge to the rear spar. Go easy on the glue, as these parts will be separated later, after sanding. Pin this assembly in place on the plans, while drying.

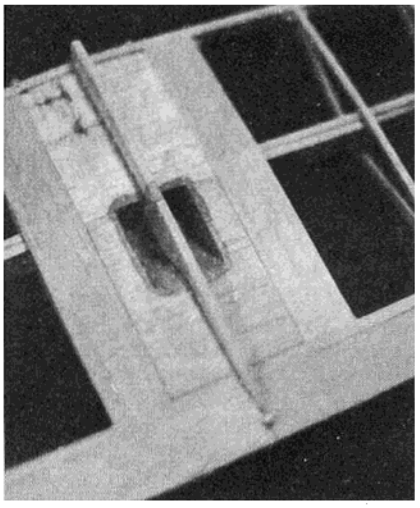
Pin down the gauge strip (1/8" square balsa) and proceed to install all lower rib forms. Rib #1 is 13/16" wide and should be light balsa. All the other ribs should be somewhat firmer stock.

Treat each rib form in the same manner. Fit each one at the rear spar, mark at the front edge position of the main spar (see View #1 on the plans) and cut (or break) off beyond the gauge strip. Now make the necessary saw cut, dampen (water or saliva) the reverse side slightly and proceed to glue and pin it in place. Angle the pins (View AA) so construction can continue. Glue and pin all lower rib forms in place and then add the main spar. Use a gauge and pin the spar so it will not move. The same gauge will be used on the other wing half.

Glue the "false" leading edge (1/8" square balsa) and the rear gauge strips (1/16" x 1/8" x 1/4") to each rib form.

Proceed to fit and glue the upper rib forms. Use the same procedure as on the lower forms. In this case, however, two cuts plus a slight notch will be necessary because we have a greater "bend" here. Wet these slightly more than the lower ones. Breaking is rare, usually caused by using too hard balsa. Try again with a new piece. This assembly should dry several hours or overnight. Remove from the building surface and cut off all the stubs at the leading edge. Sand this straight and square. When gluing on the leading edge, glue only the area near the rib ends, as most of the false leading edge (useless weight) is cut away. See plans.

Sand the trailing edge to conform (scale center and tip rib shown) to airfoil

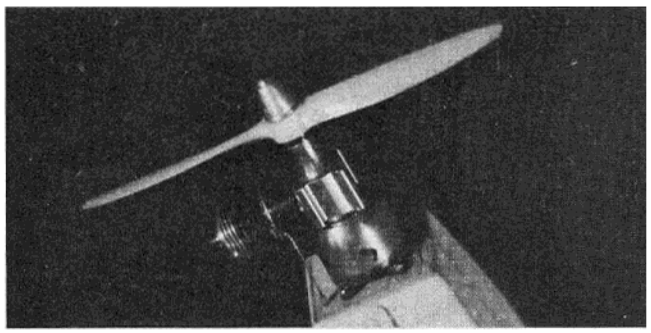


Bottom view of wing showing skid. Note thumb and finger hole for launching.

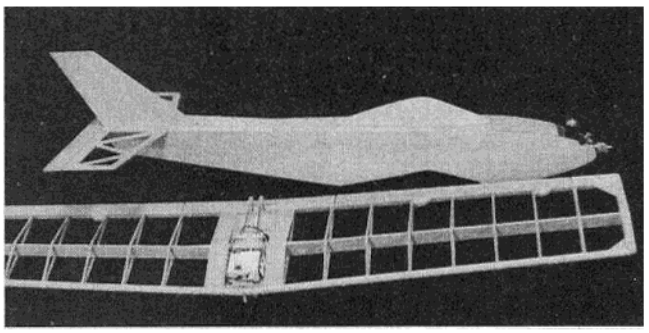
shape. Mark (with pencil) the aileron position and separate the trailing edge from the rear spar. Use a double edge razor blade and work carefully.

Put the trailing edge aside and proceed to join the wing halves. Glue the main spar brace (3/32" birch plywood is used on the SK-2) to one wing half. Use epoxy here but be sure to sand the plywood for a better bond. Always sand plywood before gluing. Clean up any epoxy that oozes out of the joint --- it's heavy.

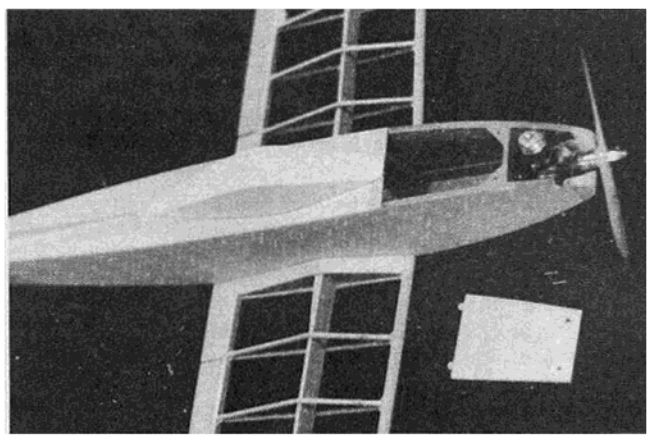
When this is dry (cured) clamp but do



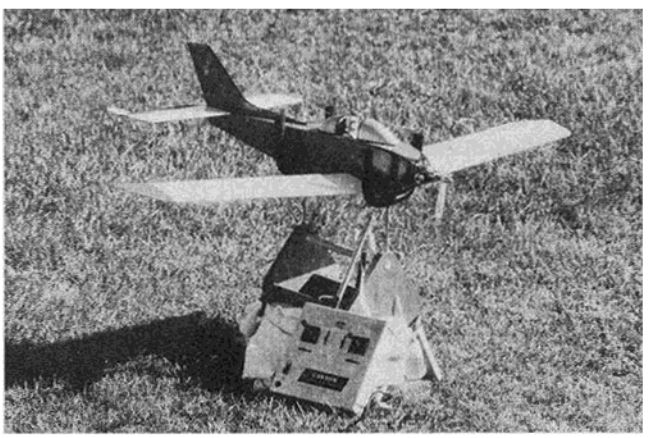
Simple throttle 'hook-up' works well on Cox Golden Bee if engine is well 'broken in' before attempting complete throttling.



Completed SK-2 ready for covering, this model can be powered with Cox Tee Dee or Medallion .049. A hot .051 should work well.



The SK-2 model showing removable hatch cover for tank access and battery pack.



Skid Kid sits on top of a Goldberg "Handi-Tote" along with Cannon radio awaiting the next flight.

not glue the other wing half in place. Check for proper fit of the leading and trailing edge braces. The leading edge dihedral brace doubles as a servo board retainer. This 1/16" plywood brace can be bent to fit (wing taper) but sand it slightly wedge shape to help the situation here. The rear spar brace (1/32" plywood) is simply bent to fit. When everything fits properly, use epoxy and clamp together. Check dihedral before epoxy sets.

I used the Du-Bro, 1/2A strip aileron linkage. Don't make the horn end of the 1/16" wire any longer than needed for your particular installation. A low profile here is desired and can be obtained using my method of installing the aileron servo. (See construction photos.) Any degree of aileron movement can be adjusted into this system without long aileron horns. In most cases, 1/4" of total aileron movement will be ample. Slightly more movement is needed on poorly fitted ailerons.

Finish gluing all the trailing edge pieces, wing tips, and tip corner braces.

Be sure to sand the leading edge, main spar, and the trailing edge flat at the dihedral break. This is shown on the plans.

Sheet the wing center sections later. Leave this open until the wing dowels have been glued in place.

Sand the entire wing now. The missing portion of the wing bottom sheeting will have to be sanded later. Shape the leading edge carefully. This is **very important.** A sloppy job here, can lead to drastic trim problems on any plane.

Vee the wing screw hole brace (at trailing edge) slightly and epoxy in place. Make sure it clears the rear fuselage bulkhead.

Fit and hinge the ailerons, but **do not** glue on at this time. Put the wing aside for now.

Fuselage: Cut out all fuselage parts. Glue bulkheads F2 and F2A together and, when dry, drill the dowel holes. At this time, drill all necessary holes in the firewall and install the blind nuts.

Glue all doublers and stringers to the fuselage sides, allowing for a snug fit of the bulkheads. When this is dry, use a Zona saw, or something similar, and make five cuts (three for SK-2) across the front doublers, as shown on the plans. This will make it much easier to bend the fuselage. More on this later.

Assemble the fuselage upside down over the plans using bulkheads F2 and F3. Square this up and allow to dry before pulling the tail end together. **Do not** glue on the firewall at this time.

Fit the wing to the fuselage, making sure it will fit straight and level — this is important. When you are sure it will fit properly, glue in the wing screw hold-down block, using the wing for a guide. It would be wise to use wax paper to protect the wing for this procedure.

When this is dry use rubber bands and pins to secure the wing in place in order to drill the dowel holes and rear screw hole. A length of 1/8" brass tubing works fine to drill the dowel holes. Put the dowels in place and glue them to ribs #1. After the wing is removed, put a couple of drops of Zap (or similar) where the dowels come through the leading edge. Now back to the fuselage.

SKID KID

Designed By : Ralph H. Pearson

TYPE AIRCRAFT
Low Wing Sport
WINGSPAN
36⅜ Inches
WING CHORD
6½ Inches
TOTAL WING AREA
236 Square Inches
WING LOCATION
Low Wing
AIRFOIL
Diamond
WING PLANFORM
Double Taper
DIHEDRAL, EACH TIP
1½ Inch
OVERALL FUSELAGE LENGTH
27⅜" (Incl. Eng.)
RADIO COMPARTMENT AREA
(L) 7" x (W) 2¼" x (H) 2½"
STABILIZER SPAN
14 Inches
STABILIZER CHORD (incl. elev.)
4" Average
STABILIZER AREA
56 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
4⅛ Inches
VERTICAL FIN WIDTH (incl. rud.)
3⅛" Average
REC. ENGINE SIZE
.049
FUEL TANK SIZE
Tank Mount (1 oz., SK-2)
LANDING GEAR
None (Skid)
REC. NO. OF CHANNELS
2-3
CONTROL FUNCTIONS
Ail., Elev.,(Throt. Opt.)
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Ply
Empennage	Balsa
Wt. Ready-To-Fly	20 Ounces
Wing Loading	12.15 Oz./Sq. Ft.

Wet all of the front outer surface of the fuselage with water from bulkhead #2 forward. Mix enough epoxy for the firewall and also enough to smear into the saw cuts. Epoxy the saw cuts first and then the firewall area. Pull the nose together and hold the firewall in position using rubber bands and pins. Wipe any excess epoxy from the doublers.

If you are going to use "NyRod" pushrod, now is the time to glue in the necessary rear support. Roughen the outer rod (at both ends) and epoxy or Zap at the rear only. The front support is glued only after servo position has been determined. Finish sheeting the fuselage and wing.

By all means, use the hand launching grip as shown on the plans. This grip area can easily be enlarged to suit your hand. Simply make a cover from scrap and, when dry, cut out the bottom sheeting below the cover.

The skid is glued on after all sanding has been completed. If this is shaped from pine or basswood, the 1/32" plywood cap will not be necessary. The vertical brace can be 1/8" dowel stock or spruce. The small brass tubes (for better grip) are epoxied in place after painting has been completed. Drill the holes for them at this time. Do not substitute dowels here, they won't do the job.

Tail Surfaces: These are simply cut to shape and sanded lightly. Use whatever hinge you prefer. I epoxied the stabilizer on at this time. More on this later. Use extra care when gluing on the rudder and dorsal fin. I glued the braces to the rudder first. I then glued this assembly to the fuselage and then added the fin.

Canopy: An "open" type canopy is shown on the fuselage side view (SK-1). This makes a handy place to mount the switch. To date, because of the horizontally mounted engine, no exhaust residue has collected here.

On the SK-2 version, however, a "closed" canopy is needed. A commercial type can be used, or you can make one from sheet balsa as I did. This one is easy to assemble and looks good on both versions.

The side view, is a true pattern. The canopy base is shown on the SK-1 fuselage top view.

Pin down the base (C2) over a protective cover and glue bulkhead (C1) in place. Brace this (C1) with a piece of scrap balsa and let dry. Don't remove the pins when this is dry, but proceed to glue and pin both canopy side pieces in place. When this is dry, remove the pins and sand across the top of the canopy to remove the bevel. Now glue (cross grain) the top cover, and pin in place.

Let this assembly dry well and then cut away the center of the base --- no need to remove the bulkhead. Lay the canopy on a piece of sandpaper and "scrub" the bottom until it is flat and level.

Proceed to sand the sides and top and "round" the corners. Shape the ends to please your eye. Now go over the top and sides with fine sandpaper and you're ready to paint.

Finish: I'll describe my finish method and you can decide on its merits and do as you like. Super MonoKote is highly recommended for the wing because of the type of construction used.

The bottom of the wing center, fuselage, rudder, elevator and ailerons were painted with three coats of Hobbypoxy color. No filler or clear was used. Sand the first coat nearly off, using 180-220 grit. After the second coat, sand with 320 grit and wipe clean. Vacuum wing and stabilizer and cover with Super MonoKote. The inner edges of the covering end at the fuselage side for the stabilizer, and 1/16" inboard at the wing bottom. The third coat of paint overlaps the covering 1/16". Use masking tape to do this (stabilizer also) but be careful when removing the tape so as not to loosen the MonoKote. Tape should be removed within fifteen minutes after the final coat. Now it is clear why I mounted the stabilizer before covering. The newer polyurethane finishes brush beautifully but be careful as they will bleed through the covering when heat is applied. It would be best, in this case, to cover before any color painting is done. In any case, I highly recommend that the fuselage be painted rather than covered with film.

Assembly: Ailerons and elevator can be hinged in place after the paint is dry. The canopy was painted separately and then carefully epoxied in place. The interior of the front half (SK-1) was given a coat of black Hobbypoxy.

A drop of fuel in the exhaust port is the easiest way to start these reed engines, so mount the engine "side winder" style.

The throttle control cable can be installed after the servo position has been planned. Use Sullivan .030 cable and tubing. The cable is tinned (solder) at front end before it is cut to length. Make a Z-bend here. If the first try fails, clip off and try again. A good job has no frayed ends. Now this can be cut to length and tinned at rear end. Use a E/Z connector at the servo arm. You may have to use a longer screw on the connector or solder a piece of 1/16" tubing on the cable end. Servo direction is not important as the ring on the throttle can be adjusted for either direction.

Use a 1" length of fuel tubing to act as a needle valve extension on the SK-2.

Radio Installation: In most cases it will be necessary to put the aileron servo in front of the main spar for balance purposes. A simple way to do this (see construction photos) is to mount the servo on a piece of 1/16" plywood with servo tape. This plywood tray can be held in position with one small screw. It will be laying flat on the wing lower sheeting. Glue a piece of scrap balsa on the main spar, 1/16" above the lower sheeting. The tray will slide under this retainer. A similar retainer of 1/8" plywood will hold the tray down and locked into position. A #2 metal screw, going through the leading edge brace and into the retainer, does the job.

Coat the servo tray with epoxy or dope in order to have a proper surface for the servo tape.

The pitch yoke can be a long servo arm or made from 1/16" plywood.

The average installation will have the battery (225 pack) in the nose compartment, the receiver directly over the aileron servo, and the remaining servos close behind.

For a three channel installation the servos should be of the smaller variety --- 1.25 ounces or less.

In my case, since I am using the Cannon 4 channel with two servos in the brick configuration, it was necessary to change two wires on the receiver-decoder board in order to have motor control along with elevator control in the brick. This is easily done, but don't try it unless you know exactly what you're doing.

Flying Notes: No provision has been made for wing tip protection on landing. Most fields, corner lots, and playgrounds, etc., are grass covered. If you insist on landing on a hard surface --- you're on your own.

Before flying, check for proper incidence. Wing and stabilizer should be at 0 degrees. Hold the spinner and tail end and check for a heavy wing. Put some weight in the light wing tip if you have this condition.

Look the wing over for any warps. These are usually easy to remove with a little heat. No washout is needed, as the wing is progressively thicker at the tips, giving good control at reduced airspeeds.

The C.G. should be as shown on the plans or slightly rearward for you experts.

You don't need hot fuels for good performance --- this is not a racing machine. Cox regular glow fuel, or similar, is easy on plugs, the finish, and your wallet. A C-3 prop seems to be ideal. Carry an extra prop and glow plug in your tool box.

If your engine is new, adjust the throttle so it doesn't close fully at low throttle. This can be done at the transmitter trim or by adjusting the ring on the throttle. This can be changed after a dozen flights or so.

I can't visualize any flying problems. If you have flown anything before this, the "Kid" will not give you any trouble --- it has no vices.

Don't run wildly (you could trip) down the field to launch the "Kid." A one-step launch is all that is necessary.

After you have the "feel" of this plane, throttle back half way, or less, and come in close for some real fun. One of my idiot friends (I won't mention any last names, Bill) likes to make furrows in the grass with the propeller, the length of the field. This will ruin any prop, so don't try it. Fly safely and have fun. □

From RCModeler Nov. 1979