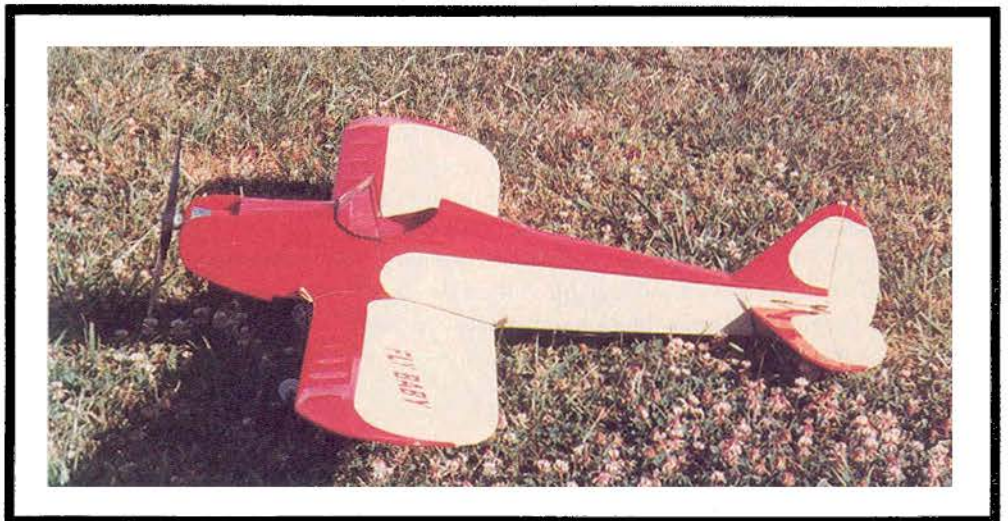
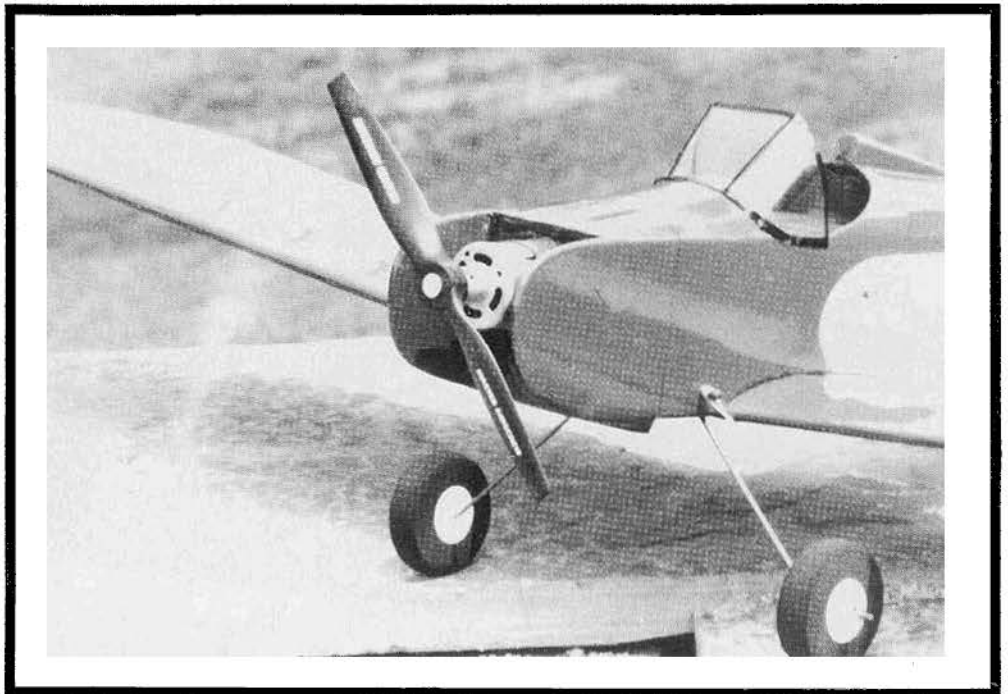


FLY BABY

By Ted Davey

Try this electric Fly Baby
— it flies as nice as
it looks.



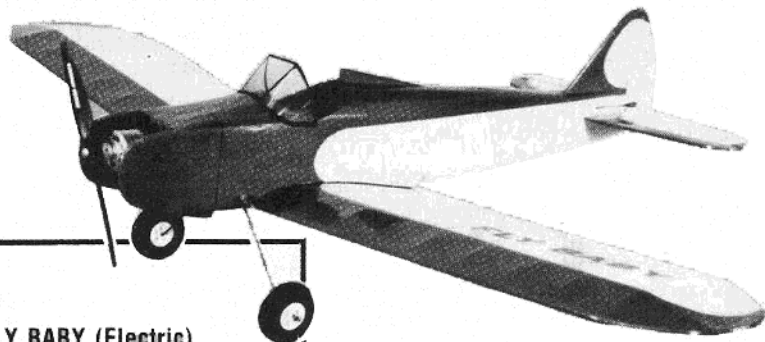
The Fly Baby Sport Scale Project presented here is the result of a search for a low wing, electric powered sport flier. What I wanted was something large enough to have a reasonable wing loading so that it would not fly like a brick, but small enough to fly well on a modestly priced motor. I also wanted a model that looked like something. The Fly Baby filled the bill on all counts. It flies as nice as it looks on an 035 Cobalt, a variety of 05 ferrites and the DSC 075, my own product, and a Master Airscrew 8 x 4 Fiberglass propeller for the larger motors. I always fly with some type of motor control whether it be a simple on-off for a sailplane or an electronic throttle for this type of sport flier. Simply turning on the motor and letting the model fly until the batteries run down not only heats up the motor and/or batteries, but it is not a very relaxing way to fly. I have used both an old Adams and an Astro Flight electronic throttle on the Fly Baby. I recommend either approach as the most enjoyable.

The easiest way to build the Fly Baby is to first make a kit by precutting all of the parts. The parts list shows the amount and type of wood you will need. The only item that is a little different is the 5/32" sheet used on the tail feathers which is made from 3/16" sheet sanded thinner once the parts are cut out. I've gone to the 5/32" rather than the more readily available 1/8" because it minimizes the chance of flutter at high speeds, and is easier to work with. If you plan to mount the motor as shown on the plans, simply wrap the 1/32" ply motor tube around the motor, cut it to the correct size, and glue the seam. Put a little piece of plastic under the seam so that the glue won't stick to the motor. Use this assembly to check the size of the motor hole and glue in place as shown. The motor can then be held in place in the tube by a piece of tape. Don't forget the 3/4" hole under the motor in F-1, as well as the 1" hole in the F-9 for a cooling air flow.

CONSTRUCTION

During the construction I used cyanoacrylate adhesives, both the thin and the gap filling types with an accelerator when required. This type of glue may not work on your choice of windscreen material, therefore, you may find a few small pins and a piece of thin tape will do as well.

Be careful in selecting the wood as you build your "kit." The spars and leading edge should be dense balsa. Everything else will be fine if it's of a medium weight. Lightweight wood throughout will save a little weight but can be a nuisance in handling the model and will make it too fragile to fly on all but the best of flying sites.



FLY BABY (Electric)

Designed By:

Ted Davey

TYPE AIRCRAFT

Sport Scale

WINGSPAN

40 Inches

WING CHORD

7 1/4 Inches

TOTAL WING AREA

275 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

Flat Bottom

WING PLANFORM

Constant Chord

DIHEDRAL EACH TIP

2 Inches

OVERALL FUSELAGE LENGTH

28 Inches

RADIO COMPARTMENT SIZE

(L) 7 3/4" x (W) 2 1/2" x (H) 2 1/2"

STABILIZER SPAN

13 1/2 Inches

STABILIZER CHORD (incl. elev.)

4 1/4 Inches (Avg.)

STABILIZER AREA

50 Sq. In.

STAB. AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid-Fuselage

VERTICAL FIN HEIGHT

3 1/2 Inches

VERTICAL FIN WIDTH (incl. rud.)

4 1/2 Inches (Avg.)

REC. ENGINE SIZE

05 Electric Motor

FUEL TANK SIZE

NA

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

3

CONTROL FUNCTIONS

Rud., Elev., & Motor Control

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Lite Ply

Wing Balsa & Lite Ply

Empennage Balsa

Wt. Ready To Fly 2 Lbs. 2 Oz. (34 Oz.)

7 Cell S.R. 900's

Wing Loading 16.8 Oz./Sq. Ft.

two places under the W-2 ribs.

(2) Using two or three of the ribs as guides, pin both the leading and trailing edges in place. Glue all of the W-3 ribs in place on the spar and to the leading and trailing edges. Cut these as shown at W-2.

(3) If you are building the aileron version, pin the two 1/4" x 3/8" x 8" aileron mounting strips to the board. Cut six of the W-3 ribs down to size as shown.

(4) Glue the plywood dihedral brace to the center spar making certain that it is perpendicular to the surface. Fit and glue the 1/16" sheet from the L.E. to the spar and from the brace to the T.E.

(5) Cut W-1 and W-2 ribs in half as shown and glue to the bottom center sheeting and to the L.E., dihedral brace, and T.E.

(6) Glue the two sets of wing tip pieces together as shown. Shim up the front of the wing tip 3/32" and glue in place as shown on the tip detail drawing.

(7) Cut, fit, and glue in place the top spar. Cut the spar at the outer rib, bevel the end, and glue to the wing tip.

(8) Prop up each wing tip the desired distance and glue the L.E., spars, and T.E. together. Glue the dihedral brace to the spars on each tip section, and glue the four gussets in place.

(9) If you are building the aileron version, mount the servo and the control cables or rods at this time.

(10) Cover the top center section with 1/16" sheet. Soak in a light layer of super glue on the L.E. and T.E. to minimize damage from rubber bands when you mount the wing. Sand off the rough spots and any extra glue. Shape the L.E. as shown.

Tail Group:

The stabilizer, elevators, fin, and rudder require very little work since you have already cut them out. Cut out the notches in both elevators for the 3/16" dowel connector. Sand the top and bottom of the dowel flatter to fit the 5/32" sheet. Pin the elevators in place, and glue in the connector. Glue the two fins together, and sand the radius on all of the parts. Cut the hinge slots in all surfaces as shown, and check the fit and alignment. Set everything aside for covering.

Wing:

Wing construction is very straightforward and is typical of small, flat bottom wings. Before you start, cover the plan with waxpaper or the plastic carrier sheet from your last roll of covering material.

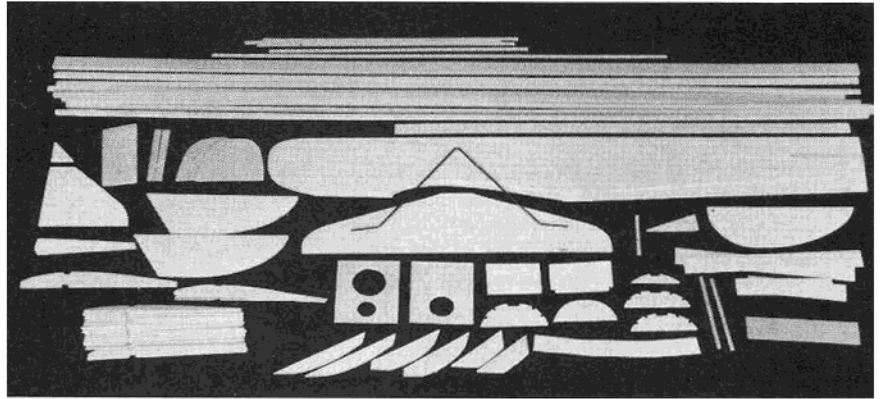
(1) Position the bottom spar over the plan, and pin in place. Cut the spar in

Fuselage:

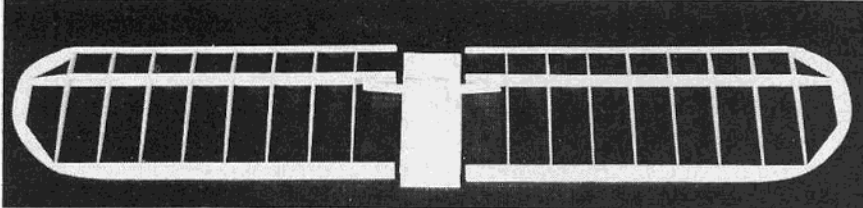
The fuselage is basically a box-type construction with some 3/16" square framework that is planked on the sides. In addition, there is some sheeting on the bottom, and a small turtledeck and cockpit.

(1) Build the 3/16" square balsa side frame over the plans as shown. Cut the longer pieces first for both sides, as well as the two 12" control rod pieces. As you cut and pin the pieces, put some pins around the outer edge so that the second side will be the same size as the first.

(2) Carefully cut the vertical pieces to size, making certain that your cuts



The parts cut out in "kit" form prior to starting.



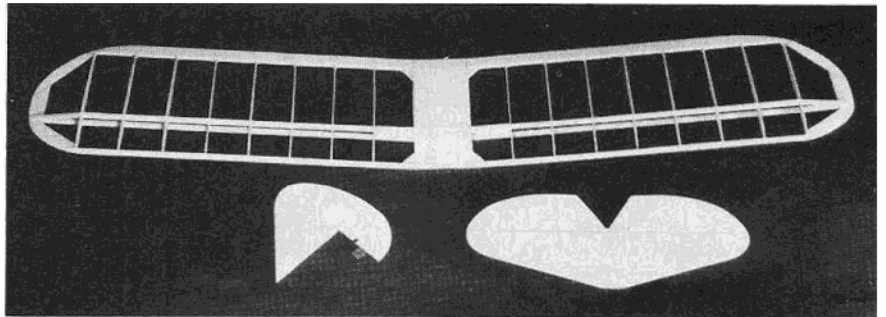
The wing pieces ready to be glued together.

are good 90° angles for proper gluing.

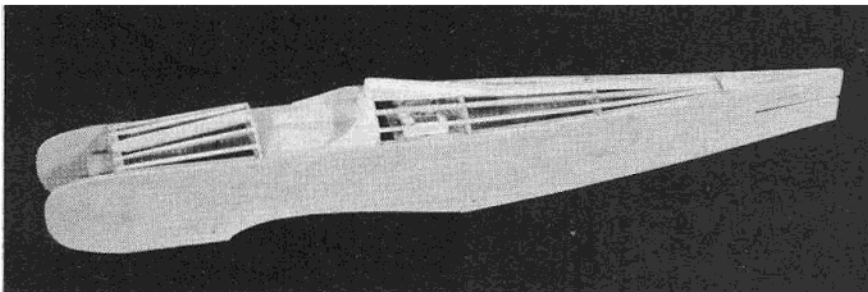
(3) Glue all of the pieces together. Glue the two gussets in place as shown on the side view. Glue the wing and stabilizer saddles in place.

(4) Remove the side from the plans when the glue is dry, and repeat steps 1, 2, and 3 for the other side.

(5) Lightly sand off the sides. Glue the frame to the 1/16" balsa pre-cut sides making a right and a left side. The easiest way to glue the frames to the side is to pin them together, and wick in thin super glue under the



The completed wing and the tail feathers.

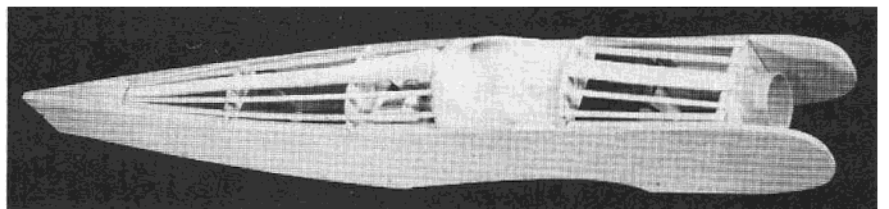


The completed fuselage ready for covering.

3/16" square pieces.

(6) Lay one side down and glue F-1 and F-9 to it, 90° perpendicular to the side. Check this carefully with a square for perfect alignment. Fabricate the landing gear wire sandwich of F-2, 3/32" scrap, and F-3.

(7) Stand the fuselage side upright, and glue the other side to F-1 and F-9. Be certain that both sides are flush to the tabletop so that the rear lines up when pulled together. Glue the F-2/F-3 sandwich in place. Cut the 3/16" square crosspieces under F-4, F-6, and F-7 at F-1, and under F-9, and glue in place. Sand the bevel in the



Another view of the completed fuselage showing the motor mount.

inside of the 3/16" square frame at the tail as shown. Pull the sides together at the tail and clamp in place to check for warps or misalignment. Check by holding over the top view of the plan. Glue together when you are satisfied

that you have a good fit. Cut the other 3/16" crosspieces to the size shown on the plans, and glue in place.

(8) Cut to fit and glue in place the cockpit floor. Glue F-5 to F-6 as shown. Glue F-4, F-7, and F-8 in place as shown.

(9) Cut the cockpit sides to fit, bend carefully, and glue in place. Moisten the wood with water to minimize the

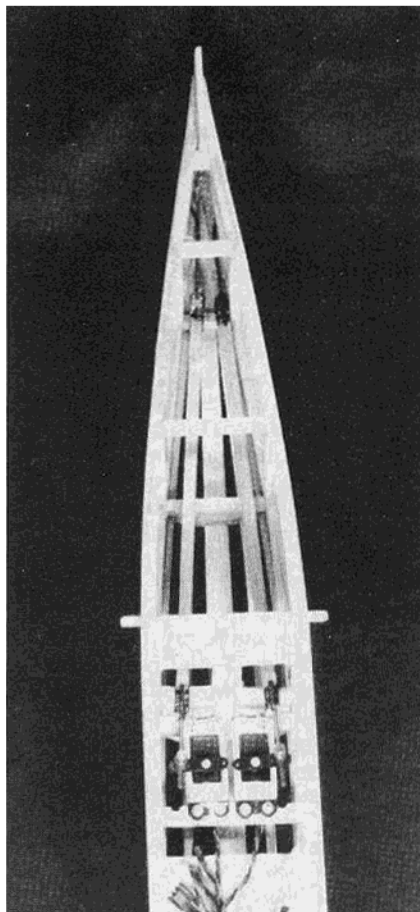
chance of cracking. Cut and bevel the 1/8" x 1/2" from F-1 to F-3, and glue in place. Cut and bevel the four 1/8" stringers, and glue in place.

(10) Taper the 1/8" x 1/2" turtledeck top as shown, bevel the small end at the tail, and glue in place. Cut and bevel the four 1/8" sq. stringers, and glue in place. Sand the headrest to shape, and set aside.

(11) Drill through the fuselage for the two wing retaining 3/16" dowels. Check the fit, but do not glue in place

at this time. Glue the 3/32" nose doublers in place.

(12) Plan your servo and pushrod installation while the bottom is still open. Position the rails depending on servo size and glue them in place.



Servo installation and pushrods.

Make up the pushrods as shown. Cut the exit holes at the rear, and mount the servos.

(13) Glue in place the cross grained 1/16" sheeting on the bottom, the lower cowl block, and the dorsal fin. Sand the entire fuselage carefully to clear off any excess glue and wood imperfections.

Covering and Finishing:

Covering the Fly Baby goes quickly because it is a small model with only few curves. If you follow the red and cream pattern shown on the plans, I suggest you make patterns first and use them to cut out the material. The prototypes were covered with Coverite's Black Baron because it not only looks good, but it also goes on easily and holds up well. It is also easy to cover with itself which is very helpful with this trim design.

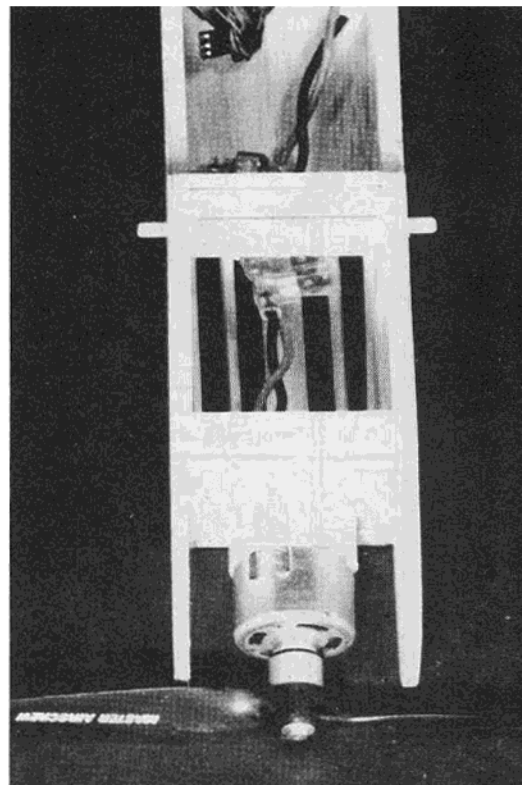
Once the tail feathers are covered, cut through the covering and insert and glue the hinges in place. Mount the wing to the fuselage with rubber bands and lay it on a table. Now check the alignment of the stabilizer to be certain it is parallel to the wing and glue it in place. Make sure that any covering material is trimmed off from the stabilizer and fuselage in the area to be glued, making certain that you don't cut into the wood which would weaken it. Check the position of the fin to be certain it is perpendicular to the stabilizer and glue it in place.

The landing gear is held in the sandwich by a screw which facilitates removal in case you bend it on a hard landing. Don't use wheels smaller than 2 1/4", particularly if you are flying from grass as it will hamper take-offs. The lightweight wheels made by Dave Brown are ideal for this model and for electrics in general.

The receiver, receiver batteries, and the speed controller easily fit in the areas shown on the plans. Put the switches out through the sides or in the cockpit area. It's a good idea to wrap these components in foam to protect them in the event of a hard landing.

The motor batteries can be secured

to the wing with Velcro or taped to the wing with electrical tape. The Velcro works well if you have more than one pack and are charging one while you fly another. Wrapping foam around the pack is not a good idea as it hampers cooling of the cells. You can also "wedge" the pack in place with pieces of dense foam. If you do this,

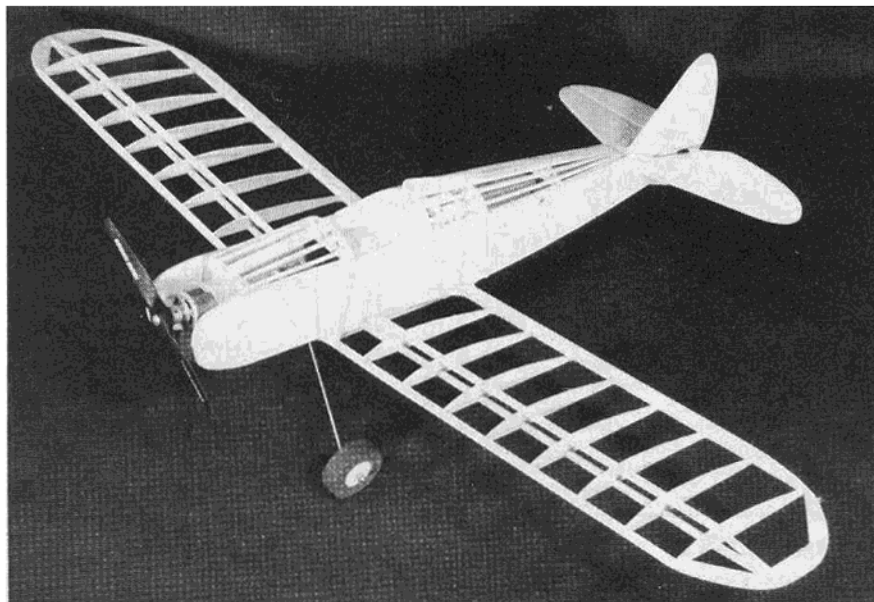


Motor installation in a bottom view prior to covering the bottom at the nose.

plan on putting a piece between the servos that protrude below them so that the batteries can't shift and jam the servo output arms. Another alternative is to glue in a couple of hooks (bent from paper clips) to the wing, and hold the pack in place with rubber bands.

Set the elevator to move 1/2" up and down, and the rudder to move 3/4" side to side. If you find that the model moves too quickly for you once you are flying, reduce the movement of the control surfaces.

If you are a newcomer to R/C flying, we suggest that you get help with your first flights. Even if you have done some flying, a new model can be different from others you have flown because it may respond to the controls differently. When in doubt, get help. Before each flying session, take the time to check out the controls and the Center of Gravity. Also, make certain that you have no structural damage from handling the model on the way to the field. When running your motor, and it makes no difference as to the size, the propeller can cause considerable damage if you are not



The completed model prior to covering



From RCModeler Oct. 1988

careful.

The Fly Baby is as docile a flier as its name implies. It flies even better than I had hoped it would. For your first flight be certain you have the correct C.G., and that your batteries are fully charged. The Baby easily ROG's, and I suggest you fly this way as it gives you more time to react than a hand launch does. Just set it down aimed into the breeze and turn up the power. In 15-20 feet, it will lift off and start climbing. Don't force it off and don't try for a steeper climb until you have some altitude and get a feel for the way it handles. Once you are up a few hundred feet, try some maneuvers to see what it will do. Then slow it down and check the stall characteristics. You will find that it will just mush along and be slow to snap into a spin --- in fact, the Fly Baby will provide you a truly enjoyable modeling experience.

FLY BABY PARTS LIST

- (3) — 1/16" x 3" x 36" Wing Planking, Fuselage Sides and Ribs
- (1) — 3/32" x 3" x 36" Formers, Nose Doublers, Saddles, Gussets
- (4) — 1/8" x 1/4" x 19" Spars
- (2) — 1/8" x 1/4" x 3" Center Spar
- (1) — 1/8" x 3/4" x 20" Wing Tips
- (1) — 1/8" x 1/2" x 18" Top Stringer
- (4) — 1/8" x 1/8" x 12" Stringers, Rear
- (1) — 1/8" x 1/8" x 18" Stringers, Front
- (1) — 1/8" x 3" x 6" Lite Ply Formers, F-1, 2, 3
- (1) — 5/32" x 3" x 36" Tail Feathers
- (5) — 3/16" x 3/16" x 36" Fuselage
- (1) — 3/16" x 3/4" x 36" T.E.
- (1) — 3/16" x 1/4" x 36 1/2" L.E.
- (1) — 1/4" x 3/8" x 16" Aileron Mount
- (1) — 1/4" x 1 1/2" x 2 3/4" Cowl Block
- (1) — 5/16" x 1 1/4" x 16" Ailerons
- (1) — 1/2" x 1/2" x 4" Headrest
- (1) — 1/16" x 1" x 7" Ply Dihedral Bra. e
- (1) — .010" x 2" x 6" Windscreen
- (1) — 3/32" x 13" Wire L.G.
- (1) — 1/32" x 1" x 4 3/4" Ply Motor Mount
- (7) — Hinges
- (2) — Control Horns
- (4) — Screws
- (2) — 8" Threaded Rod
- (2) — Keepers
- (2) — 3/16" x 9" Dowel
- (1) — 1/16" x 2" Wire Skid
- (2) — 1/8" x 5/16" x 2 5/8" Servo Mount

□

