

TALON

My interest in 1/2A R/C began when I watched a .049 powered Pacer go screaming by. I was flying a .35 powered airplane at the time. Wanting to know whether this 1/2A was going as fast as it looked, I lost some altitude and started chasing it.



This was a grand idea but I couldn't get anywhere near it! It was a little embarrassing to be outrun by something which was powered by an engine which I thought had been pulled out of one of those U-Control plastic ready to fly's! It didn't take me long to purchase a Tee-Dee .049 and start drafting out a design for a 1/2A pattern airplane. The Talon is the result. The only improvement I can think of would be retractable landing gear. Wedging the nose gear up through the fuel tank is a problem though! If any of you fellow modelers can come up with a solution to it, let me know.

The construction of this airplane is quite basic. If you have built any other R/C models, you won't have any trouble assembling this one. Cut all the parts out so that you have a "kit" and assemble it so that it is lightweight but strong. The results will astound you!

CONSTRUCTION

The glues I recommend are Titebond (or something similar) and epoxy. Epoxy use should be held to a minimum. The only places where I used epoxy were: (1) engine mount bulkheads; (2) main landing gear in the plywood, wire, plywood laminations; (3) gluing the main gear sandwich into the slots in the wing panels; and (4) butt gluing the tapered foam wing panels to the constant chord fuselage wing section.

Wing:

The way you put the sweep into the wing panels is actually quite simple. Lay the right wing panel (which comes from a Pacer kit from Ace R/C, 116 W. 19th St., P.O. Box 511BS, Higginsville, Missouri 64037) on top of the plans. Line the leading edge of the panel up with the leading edge shown on the plans. Using the point where the panel meets the fuselage, line your ruler up with the fuselage side and mark a cutting line. Do the tip by lining the ruler up with the 1/32" ply spill-plate. The left hand wing panel is done exactly the same way. The center fuselage wing panel is cut out of a constant chord wing section enclosed in the Pacer wing kit.

After all the wing panels are cut, take your ruler again and mark the placement of the slots for the main gear installation (I cut these slots with a Dremel Jig saw).

On the main gear of the first prototype I used 1/16" piano wire. After a few "student pilot" type landings I quickly discovered that this wasn't strong enough! On the next model I used 3/32" wire and found that no matter how hard I bounced it in I couldn't bend it! In order to accommodate the thicker wire you will have to use two internal layers of



plywood on the main gear laminations — one layer of 1/32" ply and one layer of 1/16" ply. The outside layers are both 1/16" plywood. When you epoxy the 3/32" main gear wire into place, make sure you rough sand it beforehand. The epoxy will adhere much better. After your gear laminations have set up and the epoxy has cured, sand the ends and epoxy on the 1/16" ply tip plates.

Follow the instructions in the Pacer wing kit when you install the trailing edge and ailerons.

The wheels I used for main and nose gear are the diamond shaped type used on control line speed airplanes. They contribute much less drag than the balloon wheels we normally use. You will have to drill out the main wheels with an oversize bit (3/32").

With an Ace R/C foam wing, you can create this neat little package powered by an .049. It's quick and fun . . .

By James N. Prell

The leading edge of the center section is self explanatory. After the glue dries, round it off to follow the contour of the wing. Drill a 1/8" hole in the center and glue the 1/8" wing alignment dowel into place.

The nylon wing retainer bolt taps into a pre-threaded wooden block. I rounded the block off on a belt sander to get the shape that was needed.

Remember — the only dihedral in the wing is that built in by the root to tip taper. You want the top of the wing to come out absolutely flat!

Fuselage:

The fuselage sides are cut out of 3/32" balsa wood. In order to have absolute accuracy I marked the placement of all bulkheads and 3/8" triangular stock with a felt tip pen. Glue the triangular stock in place first. F-4 and F-5 are now glued in place on the right fuselage side. Use a 90° template to insure that they stay perpendicular. After the glue dries, line up the left fuselage side and glue it into place. Make sure they are lined

TALON

Designed By:

James N. Prell

TYPE AIRCRAFT

1/2A Sport Pattern

WINGSPAN

35 Inches

WING CHORD

5 1/4 Inches (Avg.)

TOTAL WING AREA

180 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

Symmetrical

WING PLANFORM

Tapered Swept Back

DIHEDRAL EACH TIP

Top of Wing Flat

O.A. FUSELAGE LENGTH

30 Inches

RADIO COMPARTMENT SIZE

(L) 11" x (W) 2 1/8" x (H) 1 1/4"

STABILIZER SPAN

12 Inches

STABILIZER CHORD (incl. elev.)

3 Inches (Avg.)

STABILIZER AREA

39 1/2 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Top of Fuselage

VERTICAL FIN HEIGHT

3 1/4 Inches

VERTICAL FIN WIDTH

3 Inches (Avg.)

REC. ENGINE SIZE

.049

FUEL TANK SIZE

1-2 Oz.

LANDING GEAR

Tricycle

REC. NO. OF CHANNELS

3

CONTROL FUNCTIONS

Ail., Elev., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa & Ply

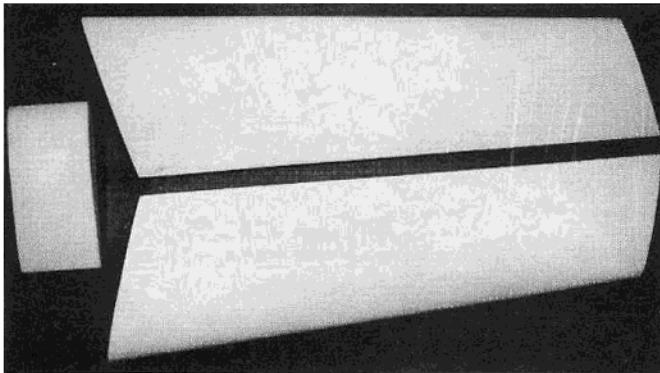
Wing Ace R/C Pacer Foam Wing

Empennage Balsa

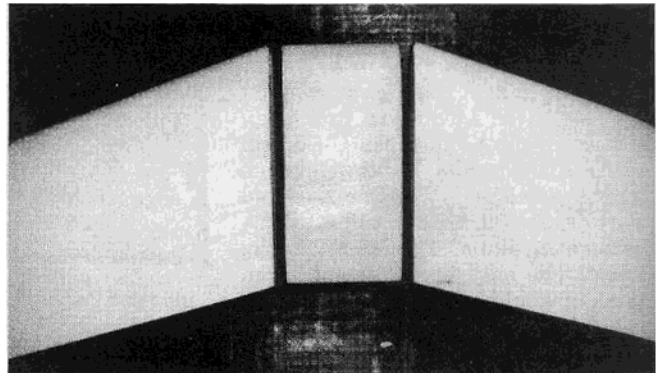
Wt. Ready To Fly 27-31 Oz.

Wing Loading 21.6-24.8 Oz./Sq. Ft.

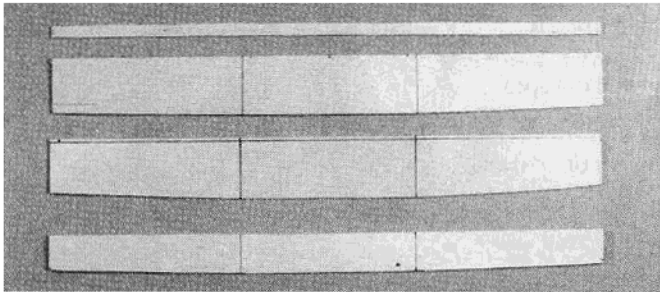
up with each other! It is easy to have built-in warps! Take a sharp X-Acto knife and cut the triangular stock at the proper angle so you can glue the fuselage sides together at the tail.



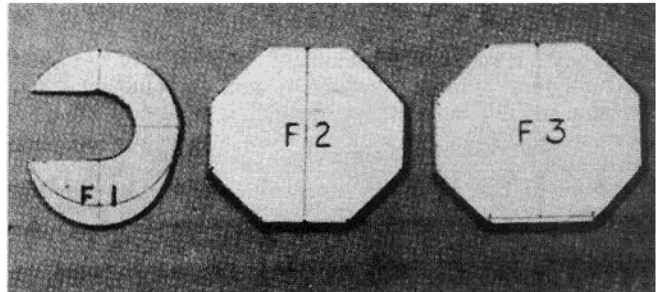
Ace R/C Pacer wing kit is used. Photo shows how it is cut.



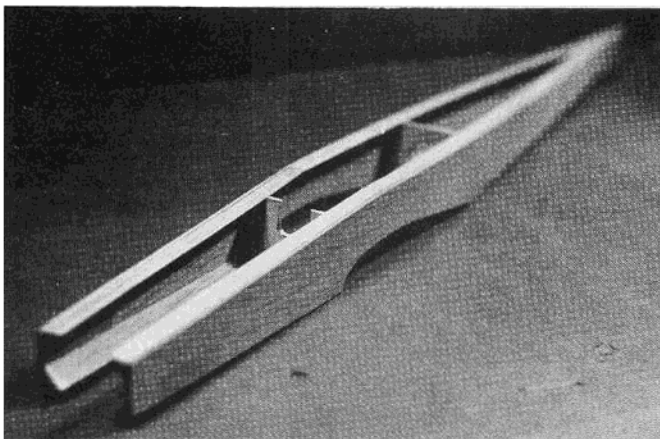
Pieces layed together to show sweep back.



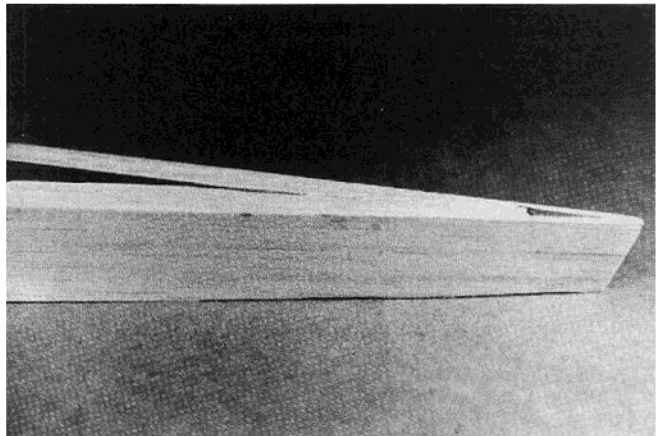
Ply landing gear pieces. Center two are 1/16" ply outside pieces. The top and bottom 3/32" ply pieces are sandwiched between and hold wire gear in place.



The three ply pieces make up the firewall and nose piece.



Fuselage partially assembled.



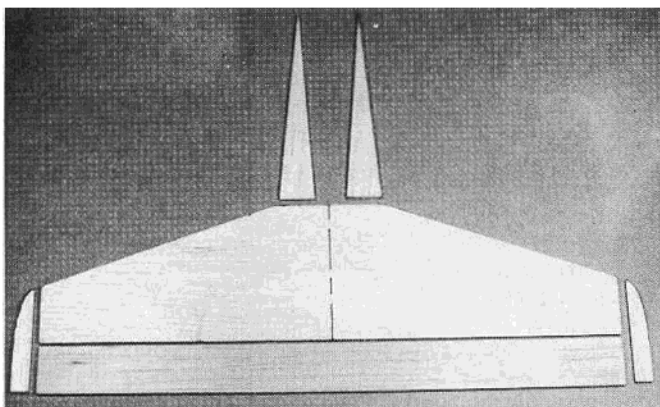
Tail pulled together. Taper triangle stock.

Engine Mount:

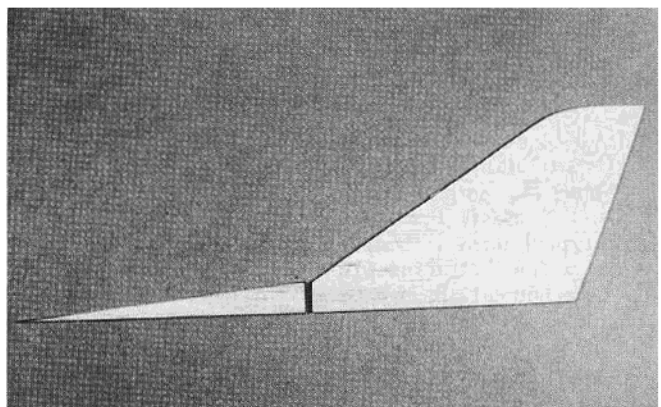
Laminate F-2 and F-3 together with epoxy. Coat the front surface of F-2 with epoxy also. Line up your engine mount with the thrust line marked on

F-2. Drill out the four holes for engine mounting bolts. Countersink these holes on the backside of F-3 and epoxy the blind nuts in place. Also drill two more holes through F-2 and F-3 for the

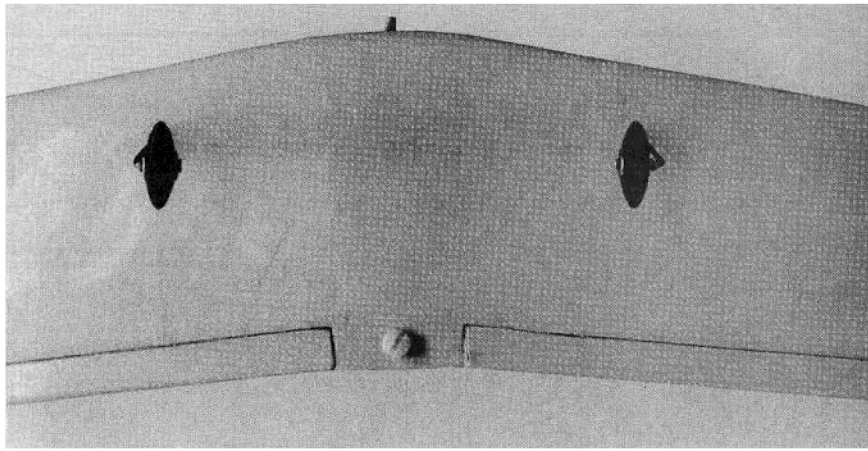
fuel line and throttle cable. Now is the time to mount the nose gear. The brass tubing that the 1/16" landing gear wire goes through is clamped in place with two metal clamps purchased at



Stab and elevator cut from 3/32" sheet balsa.



This photo shows we're not all perfect. Designer Jim Prell had to cut new fin with grain running vertical.



Bottom view of finished wing. Pick some lightweight wheels.

the local hobby shop. Four small wood screws with epoxy on the threads hold the clamps in place. I know that metal against metal contacts can cause radio interference so be very careful and check for any which might be caused by this installation.

With a couple of rubber bands, squeeze the fuselage sides together at the nose. Wedge F-2 and F-3 into place and epoxy. I beefed up the engine bulkheads by gluing triangular stock as bracing behind F-3. Make sure F-2 and F-3 are lined up **exactly!** You want a **0-0** thrust line. No up or down thrust. **No** right or left offset in the thrust line. Glue F-1 into place on the nose.

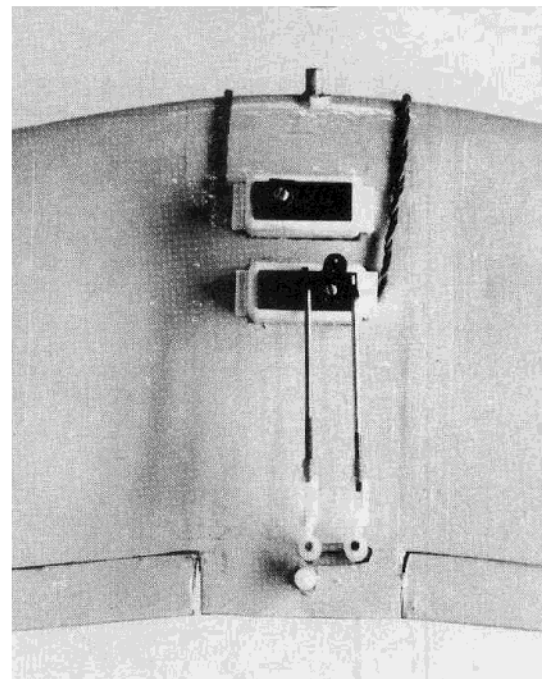
Servo Mounting:

It is best to have all servos and pushrods installed before gluing the 1/4" sheeting on top and 3/32" sheeting on the bottom. The 1/4" balsa on the bottom of the nose is tack glued in place. This is going to be the fuel tank and battery access hatch. One 4-40 nylon screw will hold the access hatch down in the front. In the rear, a 1/16" plywood piece (H-1) with a 1/8" hole drilled in it will overlap the wing alignment dowel where it comes through F-4.

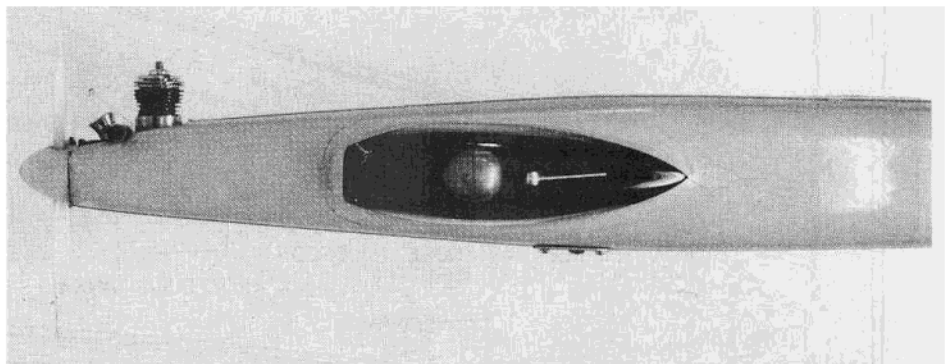
The aileron servo was mounted by carving a hole in the wing behind the main gear spar and adding two hardwood strips. The servo can then

be screwed to the strips.

After all the 1/4" and 3/32" balsa is glued on top and bottom, you can start sanding. When you think your arm is about to fall off, stop for a while and



Throttle servo was originally in wing, however, later changed per plans.



Pretty slick looking from top.

compare your fuselage contours to those shown on the plans. Once the fuselage is sanded to shape glue the horizontal stabilizer into place. A piece of soft 3/32" balsa is glued over the top and sanded so it will follow the contour of the 1/4" balsa in front of the stabilizer. Round off the edges of the strakes and glue them into place. Once the nose is sanded down to match the shape of bulkhead F-1, contact cement the engine nacelle template onto the right fuselage side. (Line the centerline of the paper template up

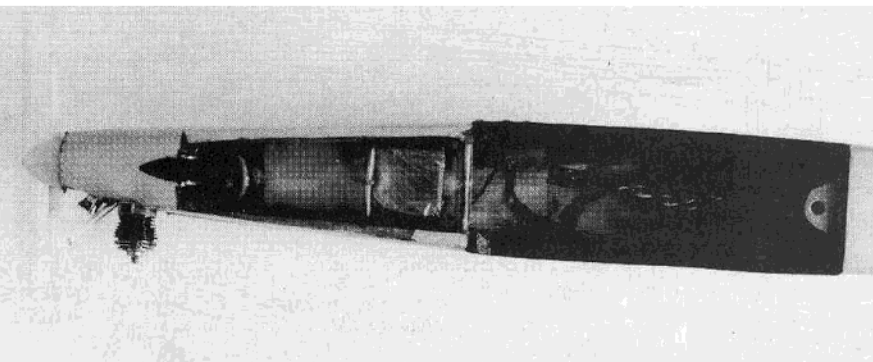
with the thrust line of the fuselage.) Take a Dremel tool and carve the engine access slot out. Now that you have an open path into the engine compartment, coat the area with epoxy to fuelproof it. Do the same with the fuel tank compartment.

Round off the edges of your vertical fin and glue it into place. (Now **don't** copy the grain direction you see in the picture of the vertical fin. That was an error on my part. I had to cut another one so the grain direction was as shown on the plans.)

Mount the elevator now. To hinge it and the ailerons I used nylon thread sewn in a figure eight pattern. There are other hinging methods which are aesthetically more pleasing, so pick your favorite and use it.

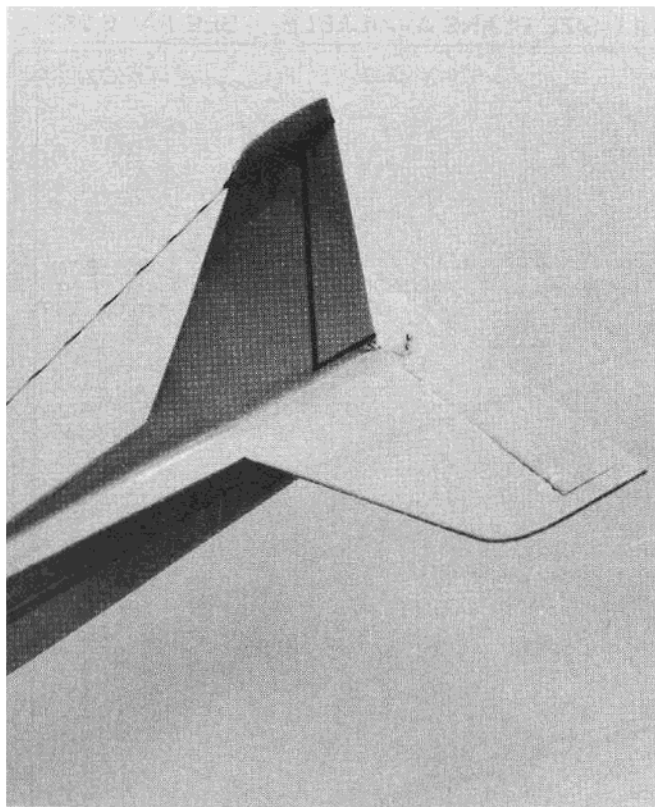
I covered the whole airplane with opaque yellow Solarfilm. The pin striping is some 1/4" stuff I got at an automotive parts store. The rudder outline is 1/16" pin striping tape. I ran a thin line of Zap CA along the edges to securely bond it to the Solarfilm.

The pilot and canopy are simple to install. I cut a 7" canopy down to the

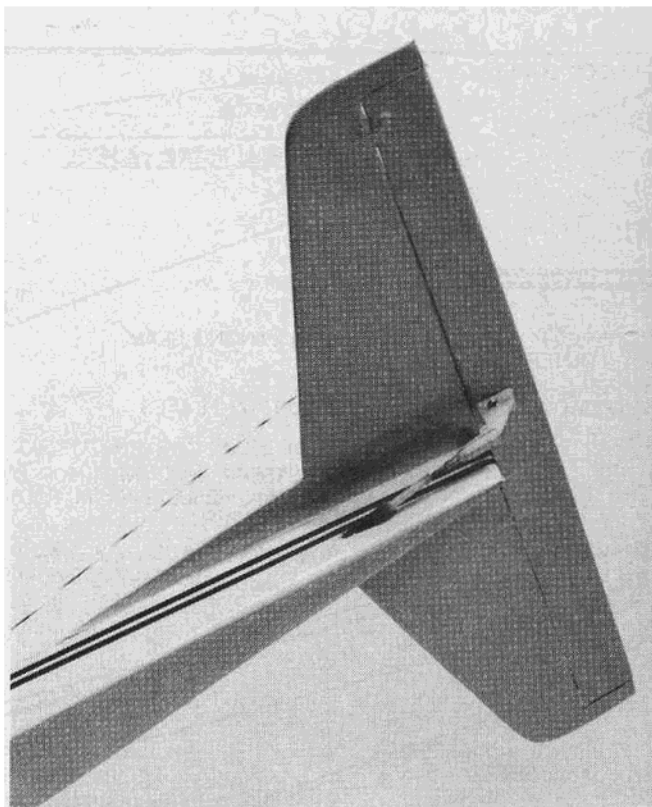


Bottom with hatch removed.

text continued on page 72



Designer used sewn hinges which keeps the gap to a minimum. Rudder outline is tape.



Use small control horn.

size shown. I lined the canopy up with the fuselage and traced around it. With a sharp X-Acto knife I cut the outline out of the Solarfilm. Using my bottle of Zap again, I made sure the edge of the Solarfilm was glued to the balsa below. Flat black dope was used to paint the open balsa. In order to fit the pilot so his helmet would clear the inside of the canopy, I had to grind his shoulders and half of his neck off! Since this aircraft design is still in the experimental category (neither the airframe or the engine are FAA certified, believe it or not), I decided to install a roll bar to protect the pilot.

First Flight:

This is where all that work you put into building suddenly seems worthwhile!

Have your aileron servo hooked up so you have minimum throw on your steerable nosegear. Make sure you have a reliable idle. Taxi the plane around a while until you are sure you can stay ahead of it. Have all control surfaces set in neutral and have minimum throw on both ailerons and elevator.

Pivot the Talon around in front of you into the wind. Check for other traffic, take a d-e-e-p breath, and pump in full throttle. After about 50 feet of take-off roll, ease back on the stick. This airplane rotates just like the fighters you see at your local Air Force base. It will roll about 5 feet more on the mains, the wings will take over, and it will scorch off into the sky!

Aerobatics are easy for this

airplane. It will do consecutive inside or outside loops without losing altitude, four point rolls and Immelmans. Inverted flight is limited only by how much fuel you have in the tank.

On your first landing don't begin to flare until the plane is about 2 feet off the ground. As the airspeed bleeds off, just feed in more up elevator. The mains will hit first and the nose will maintain its high angle of attack for about 50 feet of landing roll, until the elevator loses effectiveness and the nose finally drops.

I hope you have as many happy flights as I have had with mine. I think you will find that all the work you put into the construction was well worth it. □

