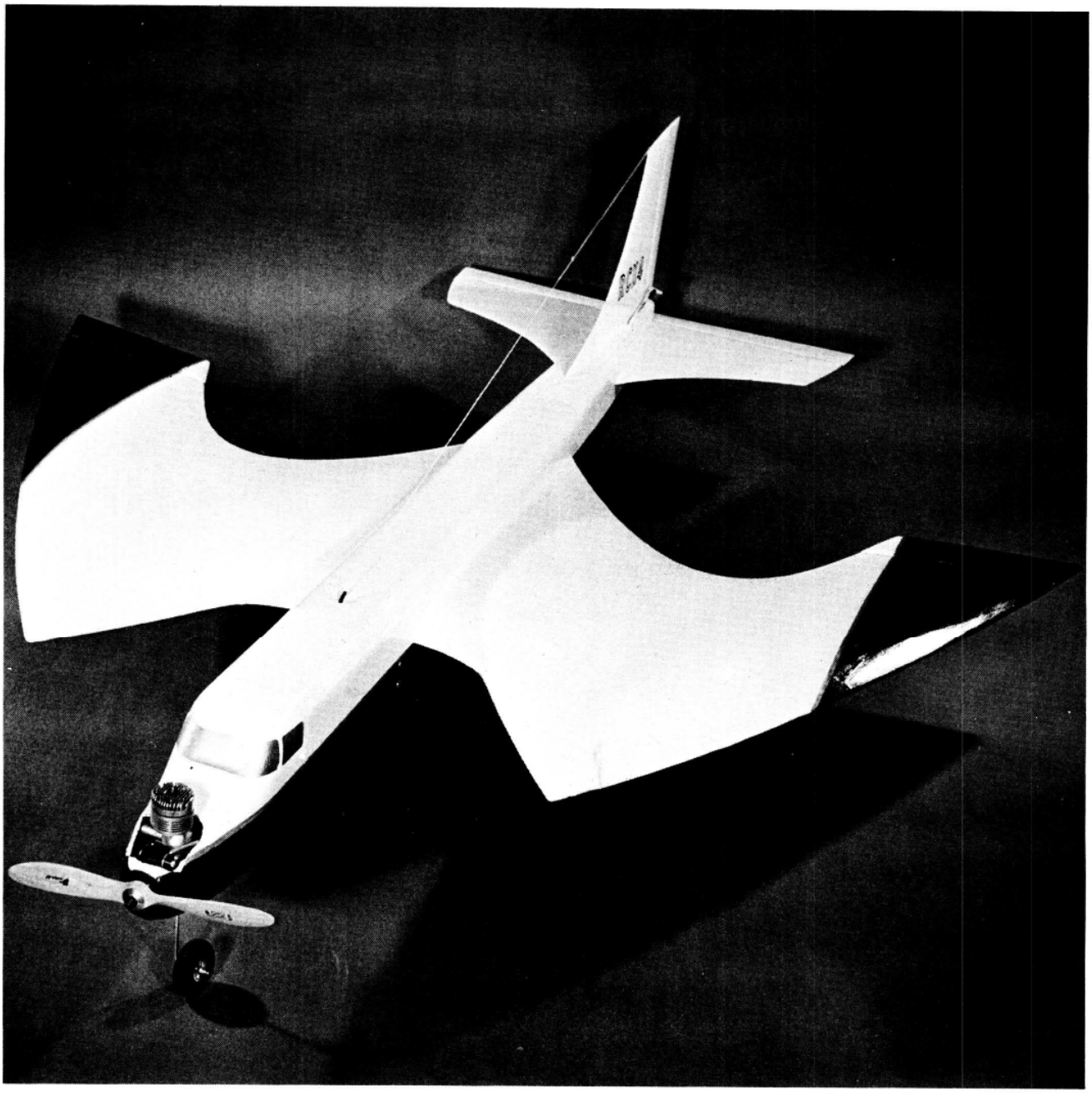
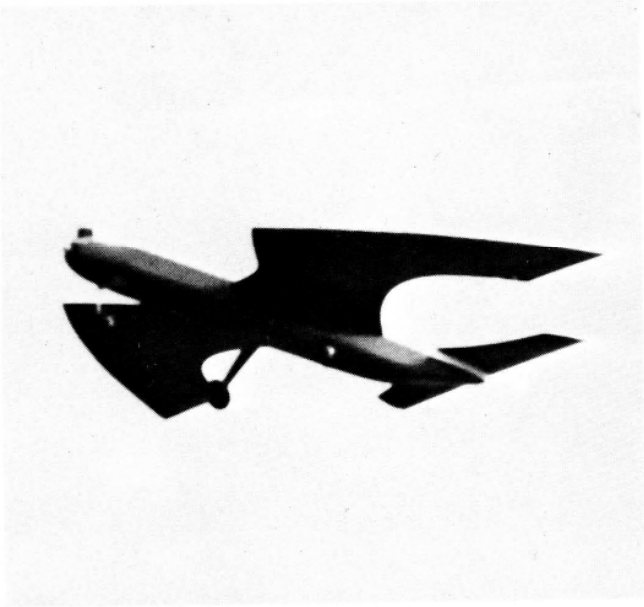
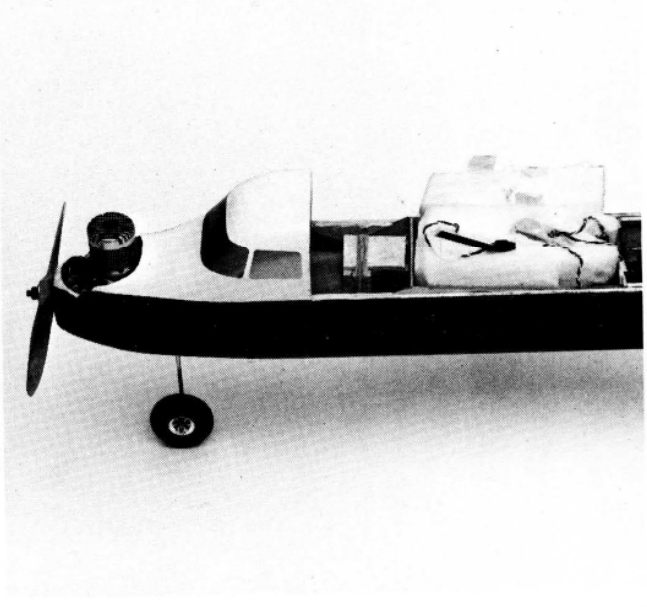
IF BATMAN AND ROBIN WERE HERE NOW, THIS WOULD BE THEIR PLANE. UNIQUE SHAPES HAVE PURPOSE, RESULTING SHAPE IS EYE-CATCHING AND FULL OF ACTION.



RCX4

by MILTON SCHMIDT





Wing shape is intended to control spanwise air flow patterns to produce a very stable flying model. Has an airliner-like fuselage.

Although powered by a 71, a good 60 will do-fine. Fuselage is a cavern, anything fits.

The Super Bat wing design is not merely an attempt to concoct a radically different configuration. Every part of its sleek design has aerodynamic improvement in mind. I'll "touch and go" on a few of the highlights.

First, the front point. This is most essential in providing the exceptionally sharp sweepback. If the leading edge did not go outward and forward first, the whole lifting section would be much too far to the rear. It gives a wider span farther ahead and affords good lateral stability. This in turn gives a very long, sharply swept wing "side" from front point to rear tip—one of the reasons for its exceptional longitudinal stability and smooth flying. The high leverage to center of gravity makes balancing much less critical. Also, wing tip is horizontal to fuselage at rear where there can be no loss in efficiency.

But what about maneuverability? The front point reaching 14 in. ahead of CG, its thickness and V-line of top convex, and flat bottom with sharp leading edges, all combine to give a high degree of response. Another factor is length of wing attachment to fuselage, which locks in almost twice the side pressure on fuselage when making turns. The previous test model (RCX3) with rudder and elevator only, did beautiful banking turns almost as if it had ailerons. (This also improves rolls.)

The RCX4 was designed with a scale-type appearance in mind—long deep fuselage, high fin and rudder, and no dihedral in wing. If neatly marked out and painted as the "Venus Express" or "Moon Cargo Lines" you might convince the judges of actually seeing one and win a scale award. It's a bit fast with a 71, but is smooth, graceful, and easy to fly. However, if you use a 60, select lightweight balsa, fiberglass around front end of fuselage only, using nothing heavier than silk and dope for other areas. The RCX4 weighed 10½ lb. minus fuel, 11½ lb. with fuel. It withstood an emergency landing on a disced field with only a slightly bent gear, so it's a very rugged ship.

Construction

With a long, level work top the entire wing can be built with one-piece spars all the way across—no center joining. Use two pieces of 1/16 x 6 x 36 balsa for each bottom. Lay one piece along outside edge as shown by the sheet lines on plan. With a ruler and sharp knife cut straight down the centerline of rib 6 pattern and weight it down in that location. Add 1/16 x 4 balsa sheeting to finish out bottom, and cut down centerline. Glue edges of sheets together. If you lay out the second piece of 1/16 x 6 x 36 inside the rib 6 line, you can get two pieces (if you follow the lines as shown). Fill out bottom, and cut down centerline. Block sand edges joining at rib line, glue together and weight down. Now you have two wing halves roughed out. Trace and cut out on light cardboard a template for wing on one side. Block sand edges to obtain accurate copy of diagram on plan sheet. Lay it on your 1/16 sheet halves to mark and cut both halves exactly the same. Lightly block sand edge of sheeting at center of fuselage line and glue together.

Spars are all 1/4 x 1/2 spruce. Glue down S-1 and S-2, then 1/4" rib No. 6, and continue with the other spars in their numerical order. Mark out position of 1/8 ribs, notch out and glue in. Piece in 1/4" hard balsa at wing tip, light 1/4" balsa block under rib No. 6 tip, and 1/2" balsa fill around front pocket as shown. With fine rasp and sanding block, round out balsa fills to rib tops, and top edge of ribs to contour of wing.

Cut enough 1/8 x 3/16 balsa strip for leading edge, lay it flat on rib points and mark. Then cut off front tips of ribs and glue in leading edge. Apply some glue on top edges of ribs from leading edge about 2" back. This will keep you from digging in when block sanding leading edge to rib contours. Glue in a 1/2" thick spruce or hard balsa triangle to hold bottom ends of S-4 spars together. Fill over top of cross spars between No. 1 ribs with 1/2" balsa up to top of ribs, then with 3/8" balsa on bottom end the same way. Lay 1/16" balsa top sheeting in approximately the same direction as on bottom.

A well stocked hobby shop should have 12 x 48" sheets of maple ply. From a 3/32" thick sheet cut out the doublers for the fuselage. Use 1/8" ply mahogany for the formers—it's lighter and you can get a small piece at your lumber yard. Glue 3/16" square balsa around the outside edges if you want more pinning area.

Build the motor mount assembly following detailed diagram on plan

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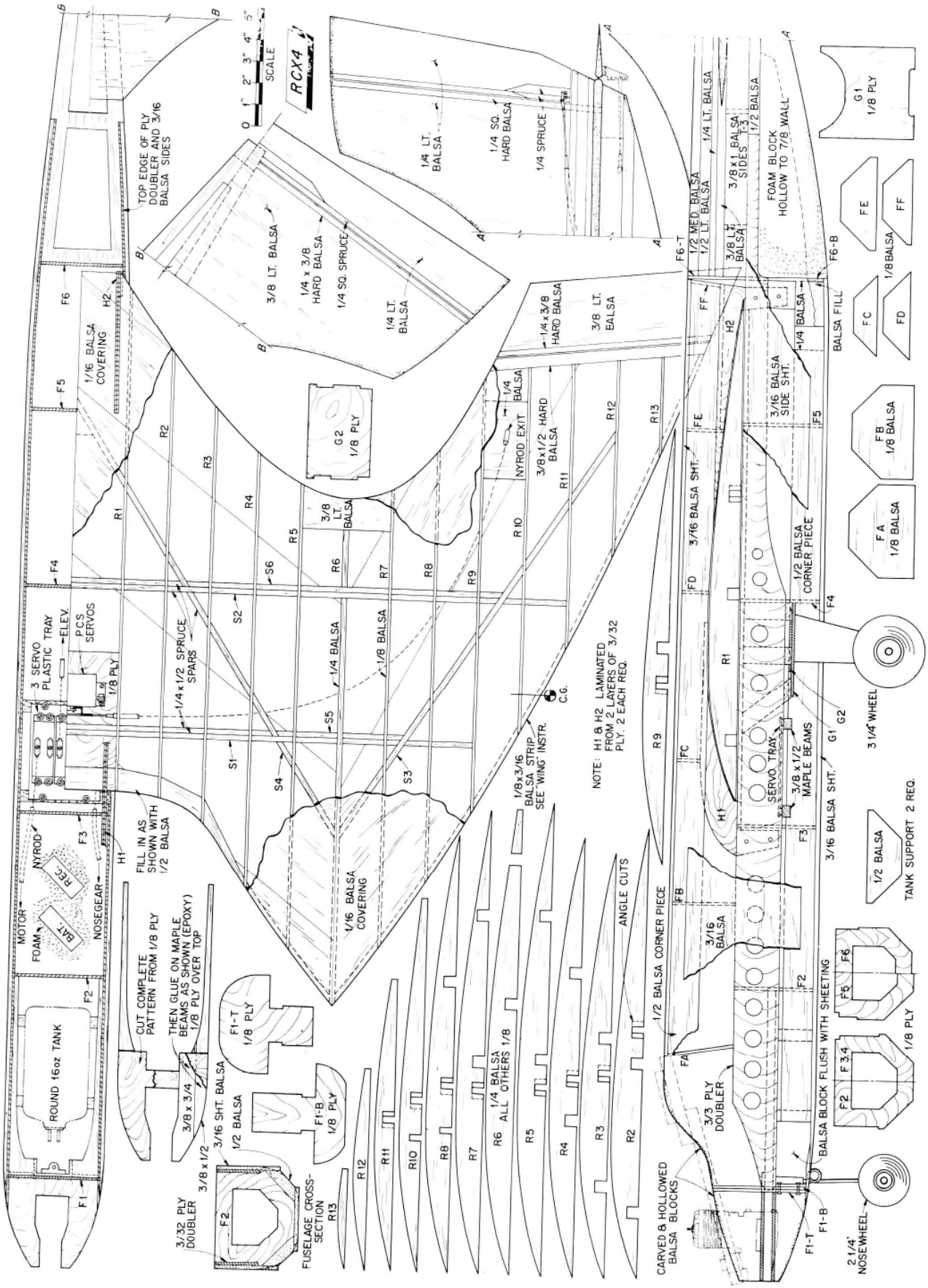

FULL SIZE PLANS AVAILABLE–SEE PAGE 84

RCX4

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sheet. If you are using a 60 instead of a 71, modify spacing accordingly. Be sure outside edges of mount assembly are straight and square, then glue to doublers as shown in plan, being careful to keep them absolutely even and perfectly aligned. Weight down on level work top until dry.

Tape a long sheet of paper to work top, and mark out entire fuselage pattern. The fuselage frame is laid out bottom side up on the outline. Tack-glue formers F-2, 3, 4, 5, F-6B and balsa plate T-2 on outline. Lay doublers flat on work top, insides facing up, and glue in 3/16" square spruce stiffeners. Then lay mount and doubler assembly over formers and T-2. Double check for exact alignment and glue together. Weight down and allow to dry, then glue in 1/8 x 3/4" maple ply supports for main gear platform. These go down from spruce stiffeners to G-1. Cut two pieces 3/32" ply (5/16" wide and 4-1/4" long) to glue on outside ends of supports and under edge of doubler. Block sand edge of these filler strips even with ends of platform supports, and glue on G-1 as shown. Glue in two 1 x 1¼" 3/32 ply under edges of doubler at rear hold-down locations, then two more 1 x 1¼ x 2 on top of them; also the 2" ones at the front hold-down locations. Install tank supports to fit your tank, and main gear on G-1. (G-2 goes in later.)

The beveled balsa corners are cut from 1/2 x 36 light balsa on a small table saw. Use a thin, fine blade set on a 45 degree angle. Take measurements from fuselage cross section on plan and check fence setting on saw table with scrap wood before running through balsa. Glue on balsa corners and rear end fill to F-6B.

I used polyurethane foam for the rear block T-1 because it can be fiberglassed. If you use styrofoam, resin or

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RCX4

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dope will melt it. Install foam block a little oversize; do not finish off until later. The 3/16 x 3 x 36 balsa sides and bottom sheeting is next, and then F1-T, F1-B, 1/8" ply triangle braces and 1/2 x 1½ x 2-7/8" balsa sides back of F1-B. Keep well weighted until dry.

Remove fuselage from work top, remove main gear bolts and glue down G-2 from inside. Use enough epoxy glue so it oozes out around bottom ends of

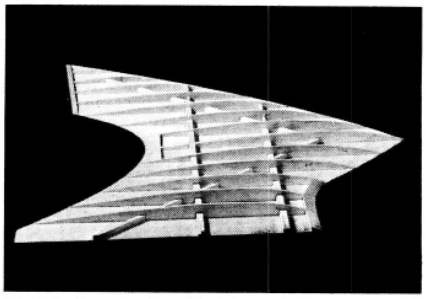
Has plenty of spactator appeal, doesn't it?

platform supports; reinstall gear. Check wheel sizes and height of main gear and install nose gear so plane sets within 3/8" of being level. Actually, this should be checked out as close as possible before buying the gears. I used an Ugly Stik gear—it's stronger than it looks. Sand down fuselage in area of first tank support (see fuselage cross section) and 1/2" balsa sides up to F1-B, then epoxy glue a piece of 1/32" ply to cover underside. This will give ample room on inside for nose gear control arm. Steam or wet for easy bend. Rough carve and hollow out front end light balsa blocks. Install engine with blind nuts and remove. Engine sets level with not more than 1 degree right thrust, or straight. Install tank, glue in balsa blocks and begin carving.

Cut the front ends of the T-3 assembly perfectly square at the front and glue down, up to back side of F-6B, and it will be easy to set in F-6T. The rest of the tail section is self-explanatory.

Cut 1/8" thick balsa formers FA to FF, also laminate wing hold-downs as shown on plan sheet using epoxy glue. Draw outline of fuselage on top of wing and fasten wing with pins or tape to its proper place on fuselage. Fit hold-downs over top of wing and against inside of double doublers. Set C clamps where top holes will be, drill bottom holes and install 6-32 bolts. Remove clamps, drill for and install top bolts.

There will be 3/8" between hold-downs and fuselage line, so fill in with 3/16" balsa to the height and length of front and rear hold-downs over top of wing. The outside 3/16" side sheeting will then come out to fuselage line.



Well-designed wing structure is fairly easy to build. Airfoil is flat bottomed so it's not a real stunter, but will sustain inverted flight.

Align and glue formers and beveled balsa corners.

Measure out and cut the 3/16" balsa sides, cut out for R-1 plus 1/16" sheet thickness. After these are glued on, install 3/16" top sheet and round off corners.

A P-C-S set was used with servos mounted on Draft-Hayes plastic trays. This gives double rubber cushioning—don't tighten them down too tight. For battery and receiver, cut a soft foam block to fill entire compartment, then cut holes in which to drop them, taping a 1/2" foam pad over top. Go to every end possible to eliminate vibration; you will have a lot less "unexplainable" radio trouble. I don't even use spinners, for just a hair out of line on a large spinner at 11,000 rpm can cause unnoticed damaging vibration.

Standard white nylon control horns were used. We started out with kwik-links or clevises in third hole as shown. After a few flights the second holes were used.

Flying

Engine used was Supertigre G-71 with Perry carburetor, 12-6 Top Flite Super M prop, 10% nitro fuel. Takeoffs were smooth and graceful—no problem. Allow a good run first few times, later progressively cut down distance and you will be surprised how this large ship moves out and takes off in a fairly short run.

There is one thing to which you need to get accustomed—when coming in for the landing, it will be going faster than it appears to be going on the approach and it's easy to slightly overrun the strip. At a safe height, practice stalling speed to be better able to judge your approaches. If possible, do your initial test flying where you have four to six hundred feet of strip.

As you become accustomed to flying the "X4," you may want to put the kwik-links in first holes on horns to demonstrate its agility through loops, rolls, etc. You won't have a contest stunter, but if there are any people anywhere close around, you will soon have a crowd of spectators.

A late model 60 in the I-plus H.P. class should handle this ship without any trouble.