Try this

"Orbit" Gas Buggy

Simple to build and easy to carry, five-foot petrol pretties are proving most popular among the fuel fans. So we're offering another nifty for you gasoliners this month. And after you've put the finishing touches on your "Orbit" you'll see that she was tagged with this astronomical pet name because she'll REALLY loop the loop!

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By Martin Powell

Drawings by Davidson

WITH the advent of small-bore engines, many model builders who own ⅞" motors are in a quandary concerning further use of their power plants. Do *you* fall in that class? Well, we know that a slew of fellows would like to combine a large engine with a small ship that will perform with the best of 'em. And our *Orbit*—contrary to common belief—proves that a five-footer *can* be fitted with a large engine!

A glance over the plans of the *Orbit* will at once prove to the reader that the model is aerodynamically efficient. Accepted practices of parasol wing and low center of gravity have been incorporated in the *Orbit* by the use of an inverted engine, under-slung rudder, and a streamlined wing mount. An added feature is a novel motor mount which will permit quick replacement if the motor loosens because of hard usage.

Yep, fans, the *Orbit* isn't the *biggest* gas job in the game, but she comes mighty close to being the *toughest* and best designed! And we know you'll agree after you've built and flown yours. So let's get goin'—

Fuselage Construction

PLANS of the fuselage should be scaled up to their proper size. When the "working" plans of the fuselage are finished, two longerons of ¼" x ¼" sq. medium balsa stock should be pinned into place. Be careful not to puncture the wood with pins, but carefully place the pins on either side of the longerons. Use very soft stock for the up-rights and diagonals. Build a second side of the body over the first to insure exact duplication. And be sure to allow sufficient time for all cement to dry *thoroughly*.

In assembling the fuselage, full-size cross-members may be measured from the plans by referring to the cross-section formers. Assemble the fuselage by cementing the last-uprights of both sides together.

When dry, spread the sides apart and place the nose cross-pieces in place. After they have dried thoroughly proceed in the same manner, working towards the tail of the model *Orbit* until all the cross-members are in place.

While the fuselage is drying, the superstructure should be cut out. Full size formers are included in the plans. Sheet balsa, 1/16", is used throughout for the formers, and no difficulty should be found in aligning them on the fuselage. All stringers are ⅛" by ¼" soft balsa. Three stringers are cemented to the top and bottom formers.

Before placing the bottom formers on the fuselage, however, it is necessary to attach the landing gear. The gear consists of two main members of 3/32" music wire.

All joints are first bound with copper wire and then "sweated" with solder. The landing gear is securely bound to the cross-members with strong thread. Coat the thread with *at least* three coats of glue. Washers are soldered to the axle to hold the air wheels in place.

The top formers of the fuselage are covered with very soft 1/32" sheet, and if desired, the wing mount may be built up of laminated ¼" sheets.

Be doubly sure that the concave underside of the wing mount fits the curvature of the top of the fuselage snugly. Cement the wing mount in its proper position with a liberal amount of cement.

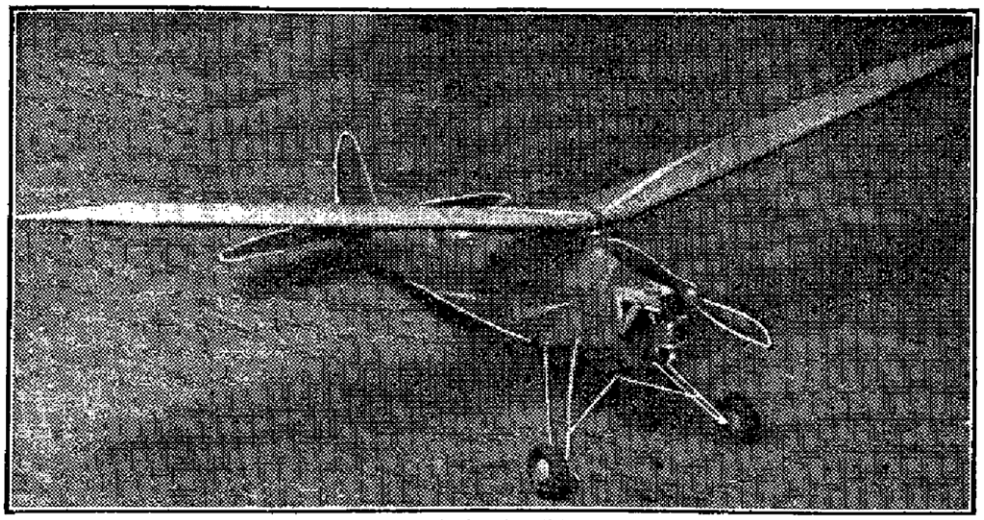
When dry, a 1/16" wire hook should be pushed into the front of the mount and a ⅛" rod should be forced into the rear. These serve as anchorage points for the rubber which secures the wing in place.

Now a small head-rest is cemented at the back of the cockpit-former and the three-ply tail fin should be glued into place. After cementing the underslung on, glue two pieces of balsa to either side of the joint and trim down into a fillet effect.

Full details of the motor mount can be found on the plans. This mount combines the best features of the wood and metal mounts. The mount proper consists of ½" dural angle bent at 90° angles. Anchorage of the motor consists of four *wood screws* which pass through the lugs and the angle into small *wood* receiving blocks. If the ship happens to hit on the nose, the wood screws will merely rip out of the blocks and all that is necessary to put the model in flying condition is to replace the receiving blocks!

The dural mount itself is bolted to the 1/16" birch plywood firewall which is, in turn, cemented directly to the front of the fuselage. Don't spare the glue as most punishment is taken at this joint.

The battery box is constructed of 1/16" sheet balsa and is made to take medium sized batteries. The box should be glued directly



Clean as a whistle and sleek as an elk's tooth, that's what this "Orbit" gashouse gangster is. (Incidentally, boys, we call her a "gangster" because she steals more than her share of ozone!) And see that lightning streak on the side of her "fooselage"? That points in the direction this model will always fly—up!

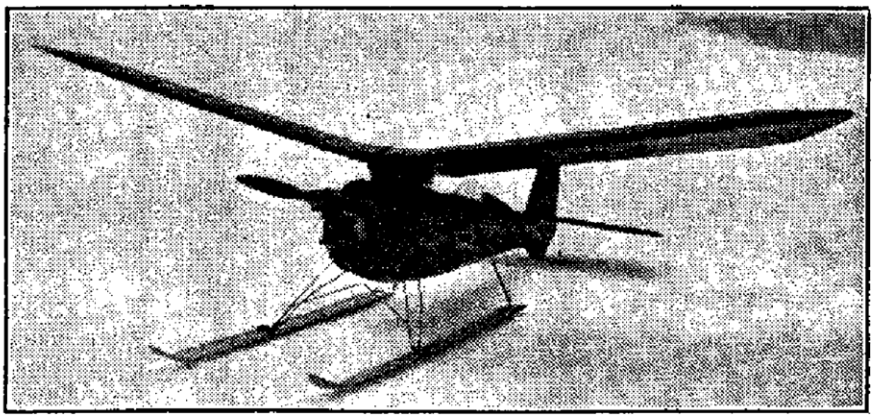
See Plans For This Model On the Following Pages

against the firewall. Make sure the springs on your box door have plenty of tension.

The entire fuselage is now covered with light bamboo paper which should be sprayed with water and then clear doped three times. Be sure to sand with 10/0 paper between each coat of dope.

Light celluloid is used for a windshield and the model may be cleaned up a bit by installing an engine cowl. The cowl is made of ½" sheet balsa glued on both sides of the motor mount. For a facing, ½" sheet is also used.

Both the bottom and the top of the cowl consist of snug fitting blocks which are held in position with eight pins. Trim the cowl to shape with rough sandpaper and prepare the surface for a good paint job by using a commercial wood filler on the balsa.



Yep, she can be fitted with skis, too! Br-r-r-r-r! It makes us cold just to think of old man winter again, though! Anyhoo, this shot shows you that our "Orbit" is an "all-weather" cloud comber. But don't take our word for it, lads. If there's any snow still around your neck of the woods, fit your ship with skis and see for yourself.

Building the Wing

THE AIRFOIL section used has shown remarkable versatility, inasmuch as the model performs well in all attitudes of flight. Characteristics of the airfoil tend to indicate that it possesses a moderate rate of speed and exerts constant lift.

As can be seen, the wing construction is very strong. A tapered spar is built in the wing-tip for flexibility, and the ⅜" diagonally located leading edge will absorb all the shock which the model will encounter. The spar is 3/16" by ¾", at the center-section, and tapers gradually to 3/16" by ¼", at the wing-tip. Trailing edges consist of ¼" by ¾" balsa and the tips are cut from ¼" soft sheet balsa.

Build two halves of the wing and assemble them by joining the spars at the center-section and cementing a ⅛" sheet balsa gusset on either side of the spars. When dry, bind the joint with thread, adding at least two coats of cement. The leading and trailing edge members of the center-section are added next.

The bottom of the spar joint should be trimmed off to conform to the shape of the center-section. After trimming the wing, 1/16" sheet balsa should be applied to the center-section. This will tend to strengthen the wing and support the rubber bands which fasten it onto the wing mount.

Complete the wing by covering with bamboo paper and finishing in the method outlined for the fuselage.

Tail Assembly

STABILIZING surfaces of this model are flat—with a rounded off leading edge and a tapered trailing edge. Main spars of both the fin and the elevator are ¼" by ⅛" hard balsa strips.

Ribs are made from very soft 1/16" by ¼" balsa strips. All curved outlines are cut from ¼" sheet balsa.

Cover and finish in the same manner as the fuselage, but be careful not to use too harsh grades of sandpaper.

Fasten the tail unit onto the fuselage by gluing a peg of ⅛" hard wood dowel under the top longerons at the last former and by pushing a 1/16" wire hook into the rear uprights of the fuselage. A few rubber bands stretched from peg to hook will secure tail to fuselage.

A beautiful finish may be had on the model by using blue dope, thinned to one-half of its normal consistency. Apply three coats. Orange trim-stripes are added with the aid of scotch tape.

Flying the Model

BE SURE before test gliding the ship that it balances perfectly when lifted at the wing spars. However, if it tends to either point its nose down or up, add a bit of weight to the opposite end to shift the center of gravity.

When you are all set, the *Orbit* should climb in a steep, sharp bank to the left, and glide in wide, soaring turns.

Incidentally, if you'd like to have a *real* thrill with your model, you can make her loop by adding a ⅛" incidence block under the trailing edge of the tail. Yep, the original *Orbit* at one time performed *seventeen* perfect loops! However, have no fear of the model stalling during loops, because just as soon as the power cuts she'll again assume a normal flight!

Before each flight, it is advisable to test-glide the ship to make sure that no shifting in weight has occurred. By this we mean that you should glide the model *Orbit* from shoulder height into the wind. Don't toss her too hard, but let *Orbit* leave your hand in a steady, forward thrust. And when your gas powered gangster performs these tests to your satisfaction, you know that it's in ship-shape condition.

Now, fellows, take your *Orbit* out where the thermals are rising and see if you can beat this record of seventeen loops. Here's hoping!

Bill of Materials

(All wood is soft balsa except where otherwise specified)

Eight sheets 1/16" by 2" by 36" medium balsa for wing ribs;
Eight strips ¼" sq. by 36" medium balsa for longerons and uprights;
Six strips ⅛" by 3/16" by 36" for fuselage stringers;
Two pieces 3/16" by ¾" by 36" hard balsa for spar;
Two pieces ¼" by ¾" by 36" medium balsa for trailing edge;
Two pieces ⅜" sq. by 3' hard balsa for leading edge;
Two sheets 1/16" by 2" by 36" for fuselage formers;
Two pieces ⅛" by ¾" by 3' hard balsa for center-section tie-plates;
Two sheets 1/32" by 3" by 36" hard balsa for cowl;
Two strips ⅛" by ¼" by 36" for ribs and tail members;
Two pieces 1/16" by 3" by 6" hard balsa for rudder underslung;
Two blocks ½" by ⅞" by 1¼" bass wood for motor hook-up;
One piece 1" by 2½" by 9" for wing mount;
One sheet 1/16" birch plywood for fire wall;
One piece ¼" by ⅛" by 36" for rudder and elevator spars;
One piece ½" sq. by 18" dural angle for motor bearers;
One pair of air wheels, washers, five feet of wire, aluminum rivets, bolts, dope, bamboo paper, cement, pins, razor blade, and elbow grease.