

Build This Swell

"GUPPIE" GAS JOB

BY MARTIN POWELL

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BECAUSE model builders persist in flying their gas jobs in any kind of weather, the tendency prevails to build rugged ships, despite added weight. It's quite a thrill to watch your gassy battle in clement weather and yet have the assurance that a hot landing won't result in its winding up like a ball of wool. But how about that same ship sent aloft on a calm day? The added weight displays itself with telling effect. Its glide would probably resemble the descending angle of an express elevator during the rush hour—straight down, full car!

Probably after witnessing such a performance, you desired to build a gas job which would combine a light but rugged structure and at the same time possess gliding characteristics that almost defy Newton's law. Well, fellow modelers, meet the "Guppie." With due modesty, the author claims this is the ship that almost does the defying!

Among the many features of this unique craft is its deep belly. During a sideslip the model will actually fly on the area presented by the odd shaped body and thus prevent the dreaded spiral dive which invariably ends up you know where. Also, the deep belly enables the model to take-off in flying position, thereby shortening the take-off run immeasurably. Now that we must fly on the 20 second motor run rule, the importance of the foregoing cannot be underesti-

mated in the least.

The "Guppie" has been designed to operate with either 1/5 or 1/6 h.p. engines. For accuracy in construction and alignment, enlarge the plans for each part in full scale and work out such sections on a table or board.

FUSELAGE AND WING MOUNT

THE FUSELAGE structure is rather unusual, inasmuch as its cross section changes from rectangular at the firewall to triangular at section "A-A" and from that point out.

Two fuselage sides are built by pinning down longerons for the upper and lower portion. The lower longeron is cut off at section "A-A" while the top longeron extends to the extreme end. Upright and diagonal members are cemented in place from the firewall to section "A-A." To assemble, cement the tops of the longerons together at the rear end also at section "A-A" on the bottom. When thoroughly dried, the firewall, cross pieces, and fuselage bulkhead are cemented as indicated on Plate 1.

A third longeron, which forms the triangle section, is cemented at section "A-A" and held in place by the uprights and diagonals. Two cross piece retainers cemented above and below the longeron are shown in their respective position on Plate I. Cement all joints generously and allow plenty of time to harden.

Because of her profile resemblance to the famed fishbowl pet, they call her "Guppie." That's not just a name—it's the secret of her success! Try your hand at this unusual flyer and see for yourself.

The metal wing mount is bent to shape from 1/16" dia. music wire to the design shown in the front view drawing on Plate 1. The perspective view on Plate 4 shows how a tin plate is placed upon the wire frame mount and soldered. Imbed the wire prongs of the mount into the fuselage sides as shown in the front view and cement securely.

MOTOR MOUNT AND LANDING GEAR

THE MOTOR mount is of the simple beam-type, extending through the firewall and the balsa bulkhead directly behind it. Angular supports for the mounts are cemented to the underside of the beams—not nailed. Use cement generously around all the joining parts.

The rear wing mounts are shaped from sheet balsa and are cemented to the top longerons, as shown on Plate 1. A cross piece extending between the undersides of the top longeron holds the rear wing hook, which is shaped from 1/16" wire. A single former made up in three sections is cemented directly over the firewall. Its stringers gradually diminish and are glued flush to the first cross piece directly behind the firewall. The sheet balsa fill-in is made up of sections fitted flush between the uprights and diagonals.

Music wire of 1/8" diameter forms the single wheel landing gear support. The design in the front view drawing on Plate 1 shows how securely it may be bound to the firewall with either soft copper wire or strong thread. Tiny holes bored at intervals in the firewall allow the thread or wire to pass through and thus hold the landing gear with great strength. Cover the entire portion with cement and allow several hours to dry. The rear skid is shaped into a hook from spring steel inserted upward into the lower longeron and cemented in that position permanently. The skid, in the position just described, heightens the angle of the take-off which thereby shortens the run.



An outstanding feature of this fine flyer is its deep belly. Additional side area presented by the odd shaped fuselage prevents the ship from going into the dreaded spiral "coupe de grace."

BATTERY COMPARTMENT

THE BATTERY box is made from the drawings shown in full scale on Plate 4. The unit is composed entirely of balsa. Be sure that when the batteries are inserted they make full contact at all times.

Cement the box to a $\frac{1}{8}$ " balsa sheet platform. The portion of the underside of the fuselage between the rear of the firewall and the balsa bulkhead is filled with this slab. This piece is mounted on pin hinges which allow the platform to flap open and downward. The hinges are situated at the forward end. After the battery box is completed with the ignition leads extending through holes in the firewall, coat the underside of the box with plenty of cement and press firmly to the door-platform.

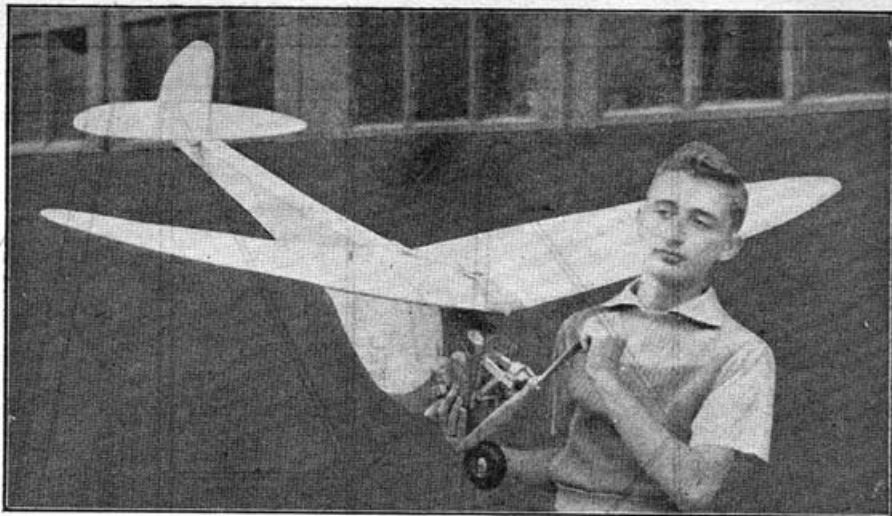
When the cement dries and the platform is swung up and locked into position, the effect will be exactly as shown in the side view of the fuselage drawing on Plate I. A sheet of balsa fill-in of $\frac{3}{32}$ " thickness is cemented on both sides of the fuselage as shown. This provides additional strength and takes up the stress exerted by the torque of the propeller. The coil and condenser are mounted with any type of wire fittings to hold them securely.

WING AND TAILS

CAREFUL PLOTTING and trimming of the ribs assures a balanced wing. The leading edge is made by inserting a hard balsa strip, $\frac{1}{4}$ " sq., in the notches and cemented at the required angle. Later, it is rounded off to conform with the shape of the airfoil section. The wing tips are made up in a series of parts which must fit flush. Aft of the No. 1 wing spar the trailing edge is tapered as shown.

Each half wing is joined together and held fast by cementing plywood tie plates in the manner shown in the perspective sketch on Plate 2. From the center rib outward, on each side of the next rib, $\frac{1}{16}$ " sheet balsa is cemented. A small section on the underside of the wing is covered with sheet balsa as indicated on the wing plan, Plate 2. The entire wing structure is covered with bamboo paper, water sprayed, and doped three times.

Tail surface parts are of simple design and construction. The stabilizer is made in one unit, rounded in front and tapered at the rear. The rudder is put together in the same manner as the stabilizer, using the materials specified. Both units are covered with bamboo paper, water sprayed, and doped three times. The perspective sketch shows the manner in which the rudder post is notched to fit the middle rib of the stabilizer. Cement this section securely.



Here's Marty Powell with his Brown-powered, single wheel "Guppie." The ship, which may be flown with any $\frac{1}{5}$ or $\frac{1}{6}$ h.p. engine, is covered entirely with bamboo paper. Construction is rugged, yet light.

ASSEMBLY AND FLYING

BEFORE COVERING the body, attach the $\frac{1}{8}$ " dia. dowel in the position shown. The fuselage is covered, one side at a time, with plain bamboo paper and is then water sprayed and doped.

Attach your airwheel and solder tin washers in place to prevent the wheels from having too much side play. A wire hook cemented at the extreme end of the fuselage assists in holding the tail surfaces down by means of rubber strands extending between the dowel and the hook. The wing is placed on the metal plate. Rubber strands extending from the front hook, across the top of the wing, and to the rear hook holds the wing in position.

BILL OF MATERIALS

Six strips $\frac{1}{8}$ " by $\frac{1}{4}$ " by 36" for lower longerons and cross braces
Five sheets $\frac{1}{16}$ " by 2" by 36" for wing ribs
Four strips $\frac{1}{8}$ " by $\frac{1}{4}$ " by 36" for ribs in tail surfaces
Two strips $\frac{1}{4}$ " by $\frac{1}{4}$ " by 36" for the leading edges
Two strips $\frac{1}{8}$ " by $\frac{1}{4}$ " by 60" for fuselage longerons
Two strips $\frac{1}{4}$ " by $\frac{3}{8}$ " by 36" for wing spars
Two strips $\frac{1}{8}$ " by $\frac{1}{4}$ " by 36" for rear spars
Two strips $\frac{5}{16}$ " by $1\frac{1}{2}$ " by 36" for trailing edges
One strip $\frac{1}{8}$ " by $\frac{1}{4}$ " by 36" for spars in elevator and rudder
One strip of sheet $\frac{1}{8}$ " by 2" by 36" for wing tips
One strip $\frac{1}{4}$ " by $\frac{5}{8}$ " by 36" for motor mount; hard pine
One sheet $\frac{1}{4}$ " by 2" by 36" for leading edges
One sheet $\frac{1}{8}$ " by 2" by 36" for trailing edges
One length of $\frac{1}{16}$ " dia. wire for hooks, length of $\frac{1}{8}$ " dia. wire for landing gear, one $4\frac{1}{2}$ " dia. air wheel, five sheets of bamboo paper, tin for wing mount, one length of $\frac{1}{8}$ " dia. dowel, dope, cement, pins and complete soldering equipment.

Make it a point to always keep fresh rubber bands handy for use on the wing and tail surfaces. Don't try stretching the bands too tight when fastening the surfaces. Under such stress the bands may give way in mid-air.

Painting your model is, of course, optional. Inasmuch as the "Guppie" is by no great shakes a show-off model, the matter of doping it up like a technicolor production is unadvisable. As mentioned before, weight is the biggest factor in gas job construction. So wherever fractions of an ounce can be eliminated, the better the endurance possibilities.

Because of the simplicity of the construction of the "Guppie," many modelers will probably attempt to build this ship as their initial effort. The writer in that case, with your kind indulgence, is offering some good advice as to the proper method of handling gas jobs.

Use ordinary precautions before test hopping and endeavor to obtain the longest glide possible. The most important phase is in getting the proper adjustment of the surfaces.

Under no circumstances attempt to fly the ship when the wind is blowing up hard. Simply because you've seen a model climb rapidly in the face of a stiff wind is no reason to assume that a craft with more power than an ordinary rubber job will do twice as good.

Choose a calm day for the first test flights. Pour just enough fuel in the tank for a few seconds flying. If your ship is equipped with a timer the fuel allotment may be greater, so it won't be necessary to refill too many times.

Spin the prop, and when the motor starts revving adjust the needle valve for smooth running.

Face the ship into the wind, open the throttle wide out, and with a slight shove send the ship on its way.