G-DUNK

If you want heads to turn at the flying field, get yourself a G-DUNK. It builds easy and flies superb. If you're an ex-Navy man, you'll remember how good a G-DUNK was.

Below, left: Paul Denson with the G-DUNK. Below, right: Bob Oblinski with Whatzit.

ge-dunk (ge dənk) n. Sweets, desert, esp. ice cream. WW II U.S. Navy usage. Dictionary of American Slang.

The first time that Bob Oblinski brought this little red 1930s vintage biplane to the field, we fell completely in love with it. We think the design and the British identification letters both hit us at the same time and registered, fantastic. The G-DUNK was not an intentional play on the word ge-dunk, it just appealed to Bob as something to put on the wing and fuselage of his plane. The name for his plane, Whatzit, came about because that is what everyone asked when they first saw it. It has been hinted that it resembled the Handley Page H.P. 42 "Hannibal," However, the Hannibal has four engines and was a taildragger. The names of quite a few other planes of that vintage have been mentioned by fliers seeing it for the first time. It is not scale — Bob said so.

When we decided to build our model, for simplicity, we made a number of changes to Bob's original. We eliminated the second engine, we made the airfoil flat bottom and removed the braces on the empennage. Since we are in love with the British identification G-DUNK, that is what we named our plane. Whatzit spent quite a few days sitting on our drawing board so measurements could be made and construction notes written so that a set of plans could be drawn from which we would construct G-DUNK.

There is very little difference in flying characteristics. The Whatzit weighs exactly one pound more than G-DUNK which can be blamed on the second engine and the second fuel tank. The G-DUNK is more of a floater because of the flat airfoil, while the Whatzit, with its semi-symmetrical airfoil, penetrates better. They will, to some extent, fly upside-down but the high dihedral makes this difficult. If, while upside-down, you give them too much rudder, they will just roll out to a standard position. Sitting side by side, it is difficult to tell them apart.

The second engine is absolutely unnecessary; Whatzit will fly steady as a rock with only the front engine. In fact, that is what happens at the end of the flight, because the Cox .15 usually runs out of fuel first. G-DUNK is light enough that full throttle on the O.S. .25 FSR Schnuerle is never used except on take-off. Generally, unless we are performing a stunt, the practice is to keep it at 1/4 throttle through the whole tank.

So without further ado, let's get into construction. Since we like fuselage construction best, we will start with the wings and save the best 'til the last.

CONSTRUCTION

Wing:

If you completely kit the wings, cutting out all the ribs, trim the spars, and leading and trailing edges to the exact length, construction will go much faster. Each wing is constructed in three pieces starting with the center section, so let's start with the top wing. Lay down on waxpaper covered plans the trailing edge, the bottom spar and the leading edge. Glue in place the bottom center sheeting of 1/16" balsa and ply. Add the three center ribs which have 1/16" removed from top and bottom. Add the top spar, glue in place, and allow to set up. Remove vertically the first 1/16" behind the spars of each wing rib, and fit a dihedral brace into this slot. When everything is flush, epoxy and clamp this brace to both spars. When this epoxy is cured, remove the 1/16" just forward of the spar and insert the other dihedral brace, epoxy and clamp. This effectively makes a sandwich with the two spars in the middle. Attach the forward ribs to the dihedral brace. The dihedral braces are narrow enough that they rest on top of the bottom sheeting and will be covered by the top sheeting. Do not add the two end ribs to the center section at this time.

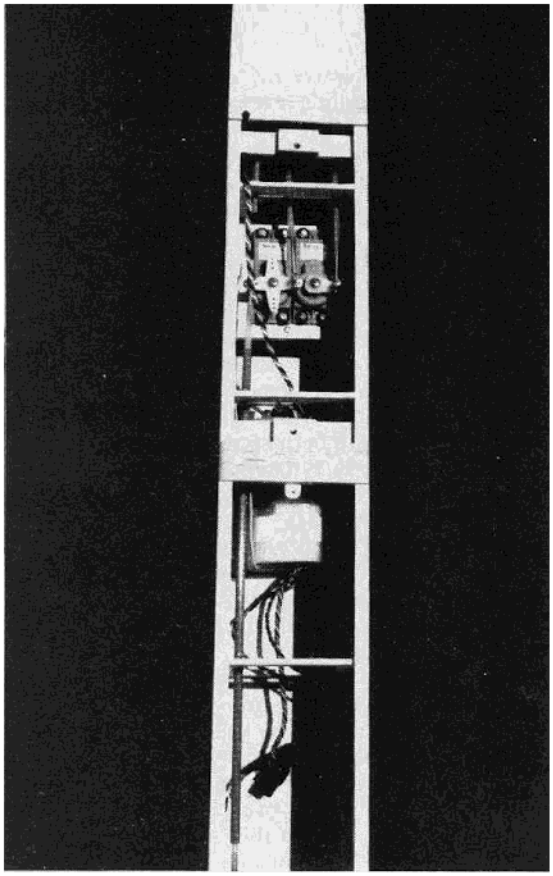
Build both of the outer panels and butt them, without glue, to each side of the center section. Do not add the inboard ribs at this time. As the top spar is put into place, add the wing tips. The outer end of the top spar is beveled to match the angle of the wing tips. Add the small triangular shaped wing tip braces.

To assemble the wing, pin the center section in place over the plans with the dihedral braces sticking out on each side. Slide the spars from an end panel between the dihedral braces. Slide it in until the spar ends make contact; some sanding and trimming will probably be necessary for a good fit. Prop the end of the wing up until there is a 2" clearance between the end rib and the workbench. Using epoxy and clamps, affix the outer panel spars between the dihedral braces. Duplicate all this with the other end. Cut the ribs at the dihedral joint to length and glue in place.

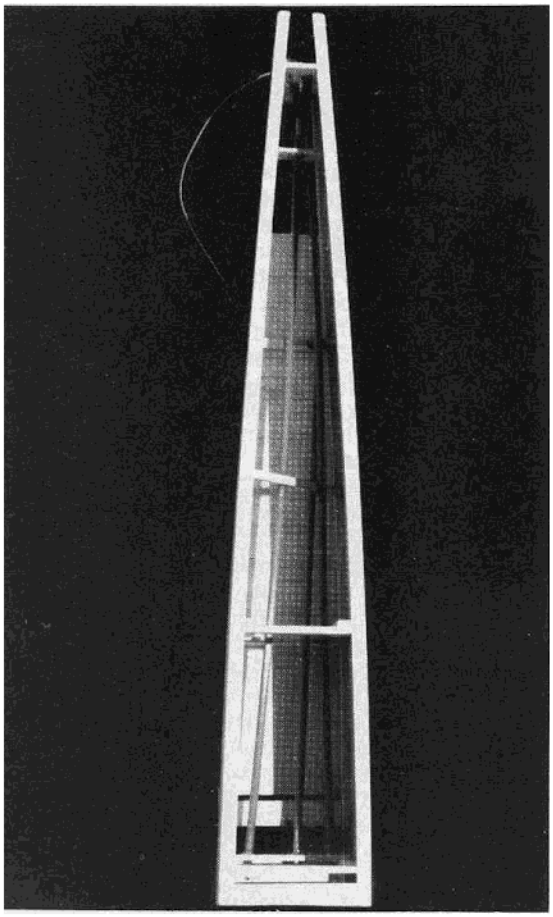
At this time, the 4-40 blind mounting nuts must be secured on the inside of the 1" x 1" ply anchors which are built up over the bottom sheeting. Carefully locate the holes, drill and pull the blind mounting nuts in securely and add a drop of CA to insure they do not pop out later. Then add the 1/16" balsa top sheeting. Do not forget the anchor blocks for the outer interplane struts. When we built the top wing, we added the 3/8" x 1/2" leading edge as it came from the hobby shop and planing and sanding it to shape was a real job. When we built the bottom wing, the leading edge was beveled with a small hand plane prior to installation which made the shaping much easier. The bottom wing is very similar to the top wing.

G-DUNK
Designed By:
Bob Oblinski
TYPE AIRCRAFT
Fun Fly Bipe
WINGSPAN
58" Upper; 36" Lower
WING CHORD
7 Inches (both)
TOTAL WING AREA
658 Sq. In.
WING LOCATION
Biplane
AIRFOIL
Clark Y
WING PLANFORM
Constant Chord
DIHEDRAL EACH TIP
2" Upper; 1¼" Lower
O.A. FUSELAGE LENGTH
38½ Inches
RADIO COMPARTMENT SIZE
(L) 11½" x (W) 2½" x (H) 3"
STABILIZER SPAN
20 Inches
STABILIZER CHORD (incl. elev.)
5½ Inches
STABILIZER AREA
110 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
6 Inches
VERTICAL FIN WIDTH (incl. rud.)
5¼ Inches
REC. ENGINE SIZE
.20-.25 2-stroke
.20-.30 4-stroke
FUEL TANK SIZE
4-6 Oz.
LANDING GEAR
Tricycle
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rud., Elev., Throt.
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage ..... Balsa, Ply & Spruce
Wing ..... Balsa, Ply & Spruce
Empennage ..... Balsa
Wt. Ready To Fly ..... 53 Oz.
Wing Loading ..... 11.6 Oz./Sq. Ft.

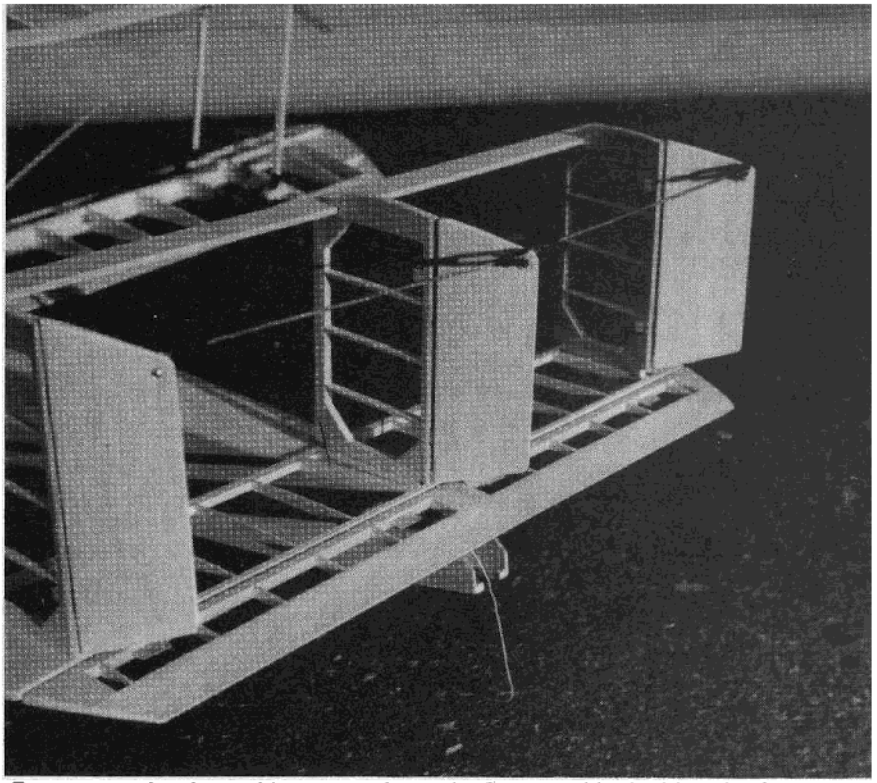
By
Paul F. Denson
and
Bob Oblinski



Top view showing radio in forward compartment. Servos are located in aft compartment (beneath wing).



Pushrods to empennage. The third tube is a hollow section of a plastic shade to hold the antenna.



Empennage showing rudder connecting rods. Center rudder is driven by the servo.

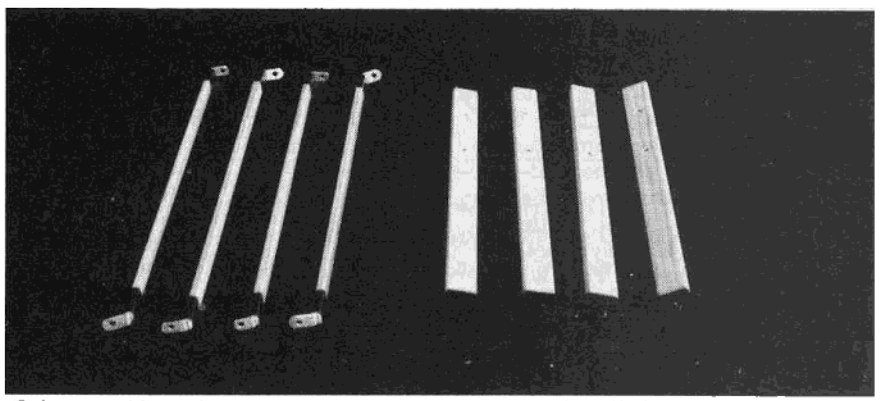
Bottom wing dihedral is 1¼" under each tip.

Fuselage:

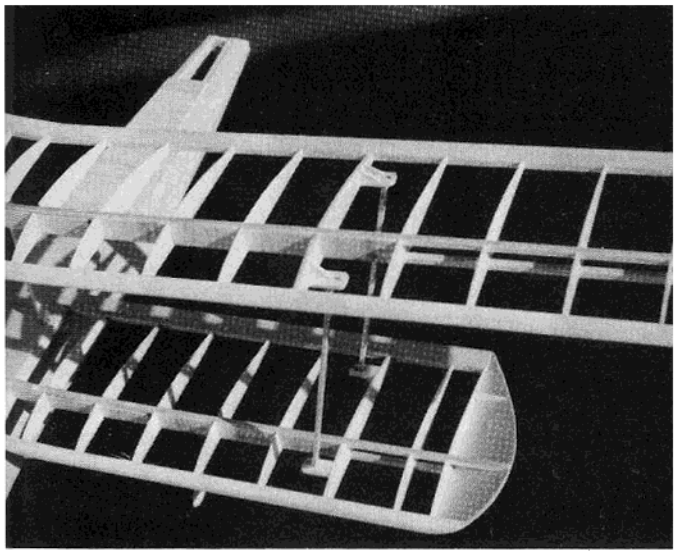
Former #1 is of 1/8" aircraft ply, former #5 is balsa, and formers #2, #3 and #4 are cut from 1/8" lite ply. Cut formers #1 through #4 to identical size and cut out 3/16" x 3/16" corner notches for the longerons. Then remove the center section of formers #2, #3 and #4. Trim 3/32" from the top edge of former #2 to allow clearance for the hatch cover.

The fuselage sides are cut from rather hard 3/32" sheet balsa. Two sides are made by gluing the 3/16" square spruce or pine strips longitudinally down the top and bottom of each side. Make sure you have constructed right and left sides. Add pencil marks on the inner surfaces of each side showing the location of the formers. Lay the right side down on your workbench, erect and glue formers #1 through #4 in place. Using a square, make certain the formers are perpendicular to the side. When dry, add glue to the upper edges of the formers and put the left side in place. Making certain everything is square, add strips of masking tape to clamp everything tightly in place.

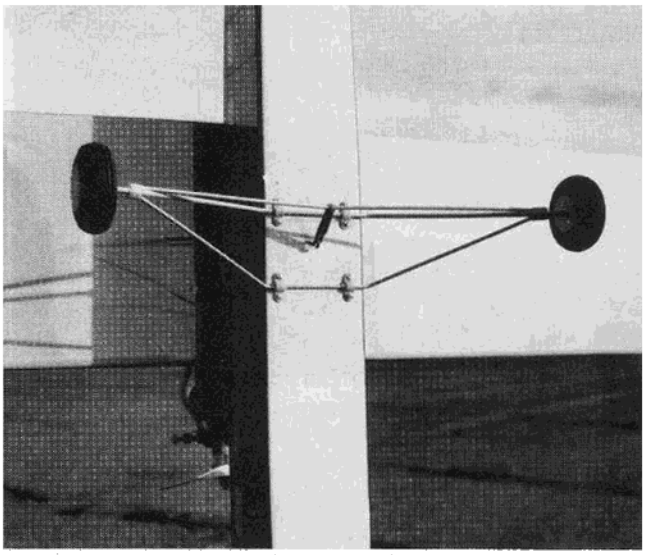
When all is secure, glue and tape formers #5 (1/8" balsa) and #6 (1/8" lite ply) in place. Add the landing gear support, bottom sheeting, and two layers of sheeting just forward of the hatch. The nose block is built up using pieces of 1/2" sheet balsa and 1/2" triangular stock. After the outer surface of the block is carved to shape, spot glue it to former #1 and fair it into the fuselage. Break the glue spots, removing the nose block from the fuselage. The nose block must be hollowed out so there will be enough room for the flight pack battery and



Cabane and interplane struts varnished and ready for installation.



Interplane struts and anchors.



Landing gear attachment. Note spreader bar, spring, and Kraft wheels.

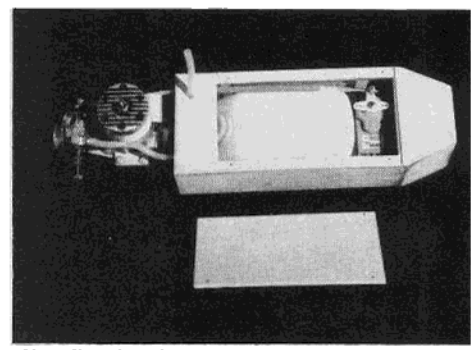
any weights necessary to properly balance the model. Small hardwood blocks are epoxied to former #1. Number two sheet metal screws through the side of the nose block into the hardwood blocks hold the nose block in place.

A standard 1/8" nose gear and hardware is used. The mounting bracket is fastened to the inside back of former #1 with 4-40 machine screws and blind mounting nuts. A 1/8" lite ply doubler is glued in place between formers #3 and #4. 4-40 machine screws pass through the side and this former into blind mounting nuts and hold the center cabane struts in contact with the fuselage.

To hold the bottom wing in contact with the fuselage so it does not ride up on the cabane struts, it will be necessary to run two 4-40 nylon bolts or machine screws through the wing into threaded ply cross members atop the fuselage. Make four cabane struts from 3/16" x 1/2" pine or spruce. With a fine bladed saw, cut 3/4" long slots in each end. You will insert the tabs you fabricated from aluminum or brass in these slots. Epoxy in place and lock with 1/2" 2-56 machine screws and nuts. Install the central cabane struts with 4-40 machine screws. Put the bottom wing in place by pushing the struts through holes in the wing, then fasten in place with the two hold-down screws; this should hold the struts erect and pretty well in place.

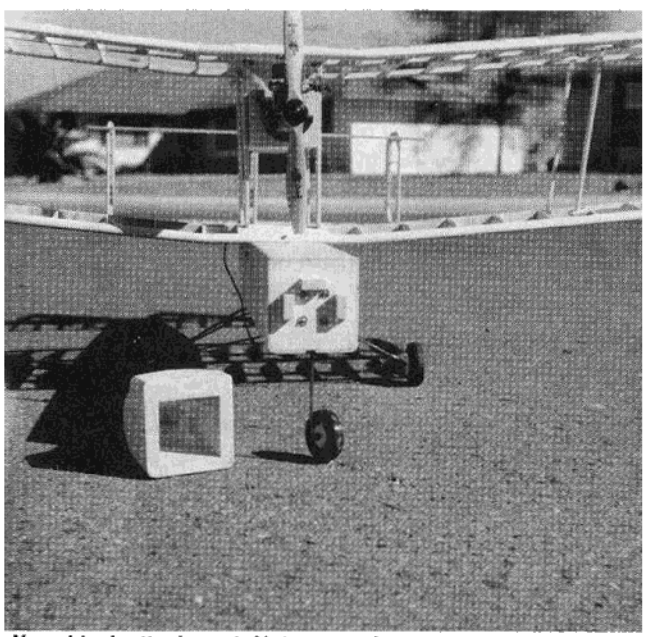
Nacelle:

The nacelle is constructed in a manner similar to the fuselage, two sides with longerons and formers. Four 1/8" ply vertical doublers 1/2" x 1¾" are added to the sides

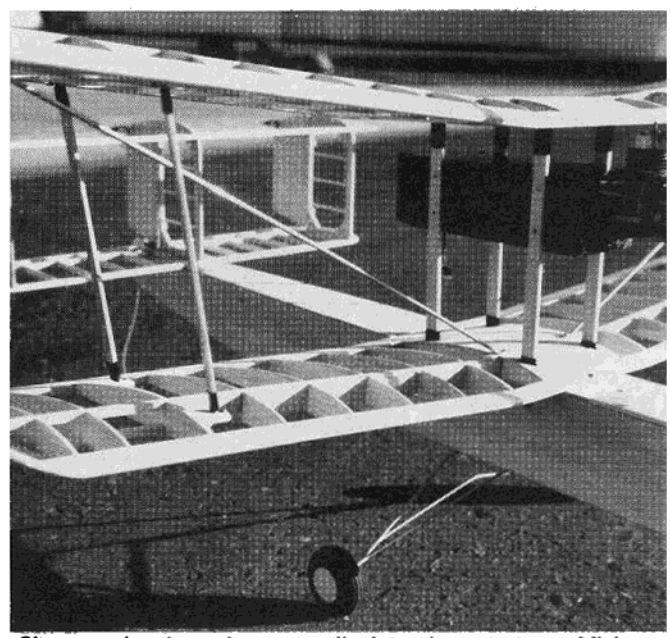


Nacelle showing engine, fuel tank, and throttle servo.

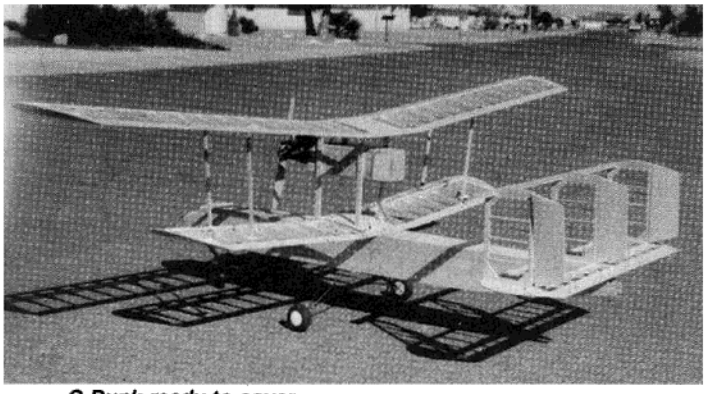
parallel and in line with the cabane struts. These fit between the longerons. Sheet metal screws through the cabane struts, the side of the nacelle, and the doubler, hold the nacelle in place. The width of the



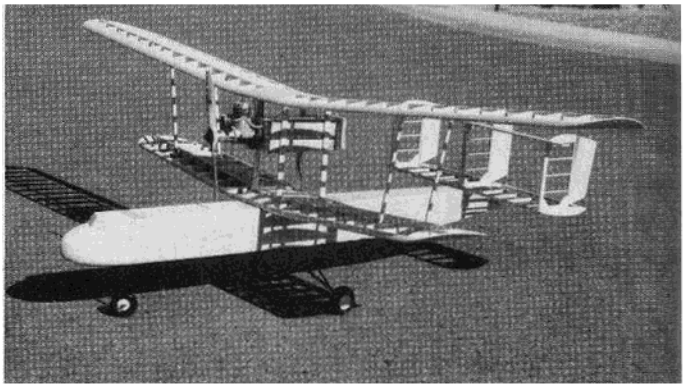
Nose block attachment. Note prop clearance.

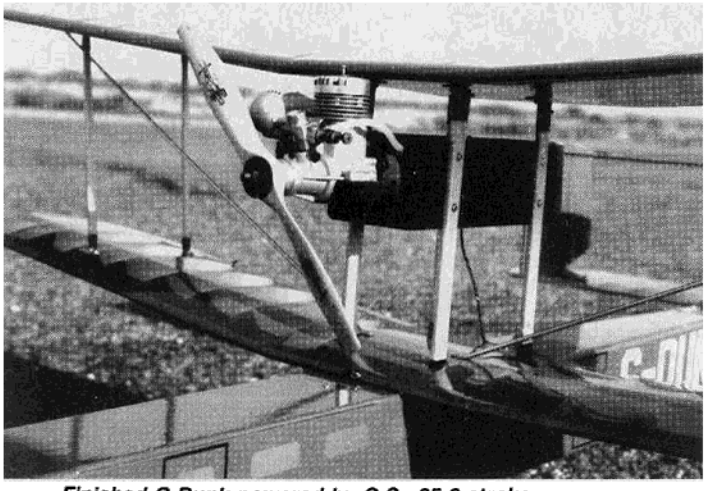


Close-up showing cabane, nacelle, interplane struts, and flying strut.

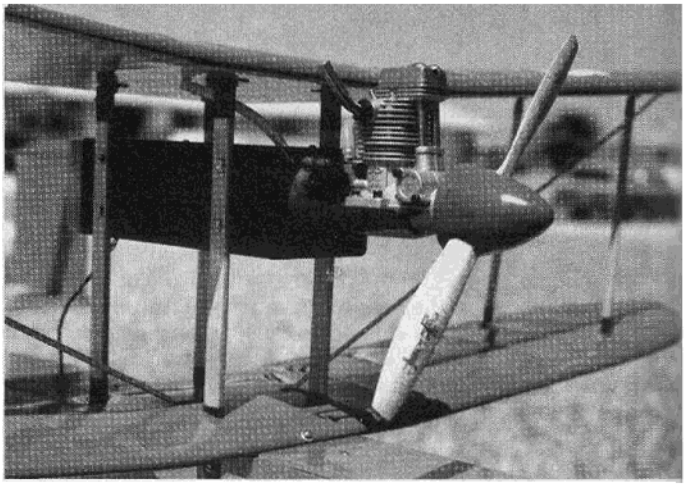


G-Dunk ready to cover.





Finished G-Dunk powered by O.S. .25 2-stroke.



G-Dunk with O.S. .20 4-stroke mounted.

nacelle **must** be exactly the same as the space between the cabane struts. If it is a little bit too narrow, washers can take up the space. If it is too wide, you are just going to have to build another one, the **width** between the struts is the key. Our nacelle was fitted together roughly, being held in place by masking tape, this way it could be checked before it was too late.

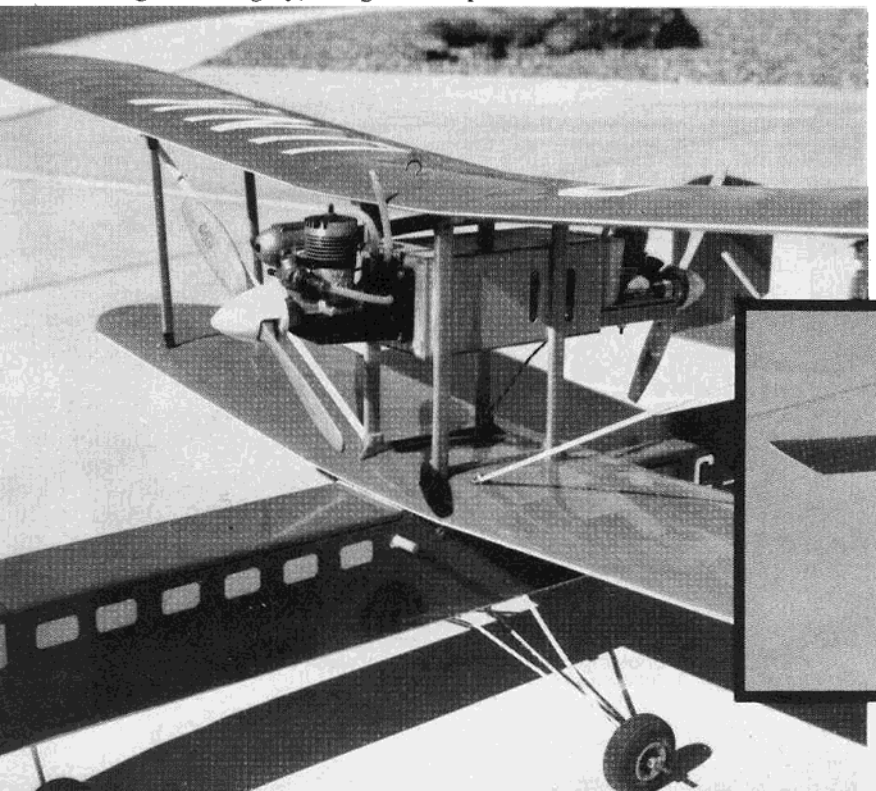
We used a 6 ounce tank. Be sure to check the internal dimensions of the nacelle before you buy your favorite brand of tank.

Empennage:

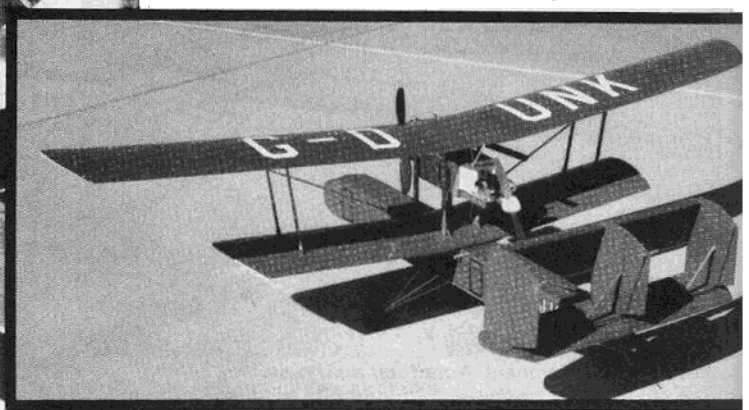
The stabilizer is, for all practical purposes, standard. There are three slots for the fins, rather than one. The elevator is a bit different from the normal tapered sheet balsa one, but should not throw you a curve.

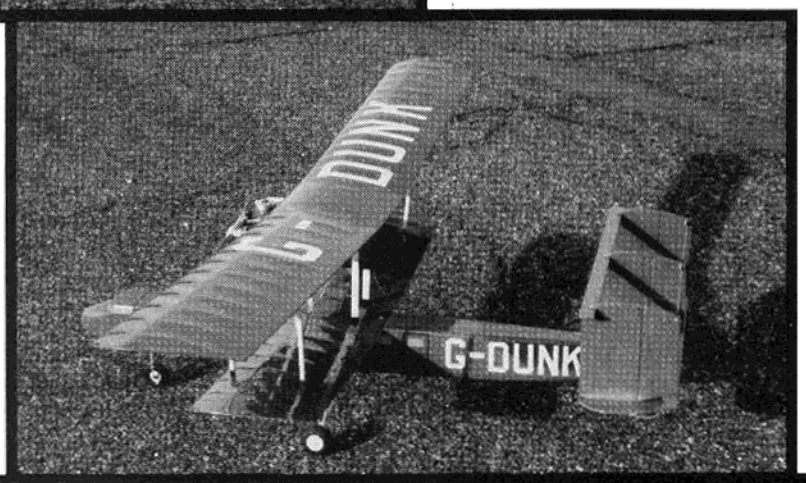
The fins and rudders are standard — there are three of them. Each fin has a 1/8" slot built into the top forward edge for a second stabilizer/stiffener which tends to neutralize the torque applied to the fins by the rudders.

Motion from the center rudder is

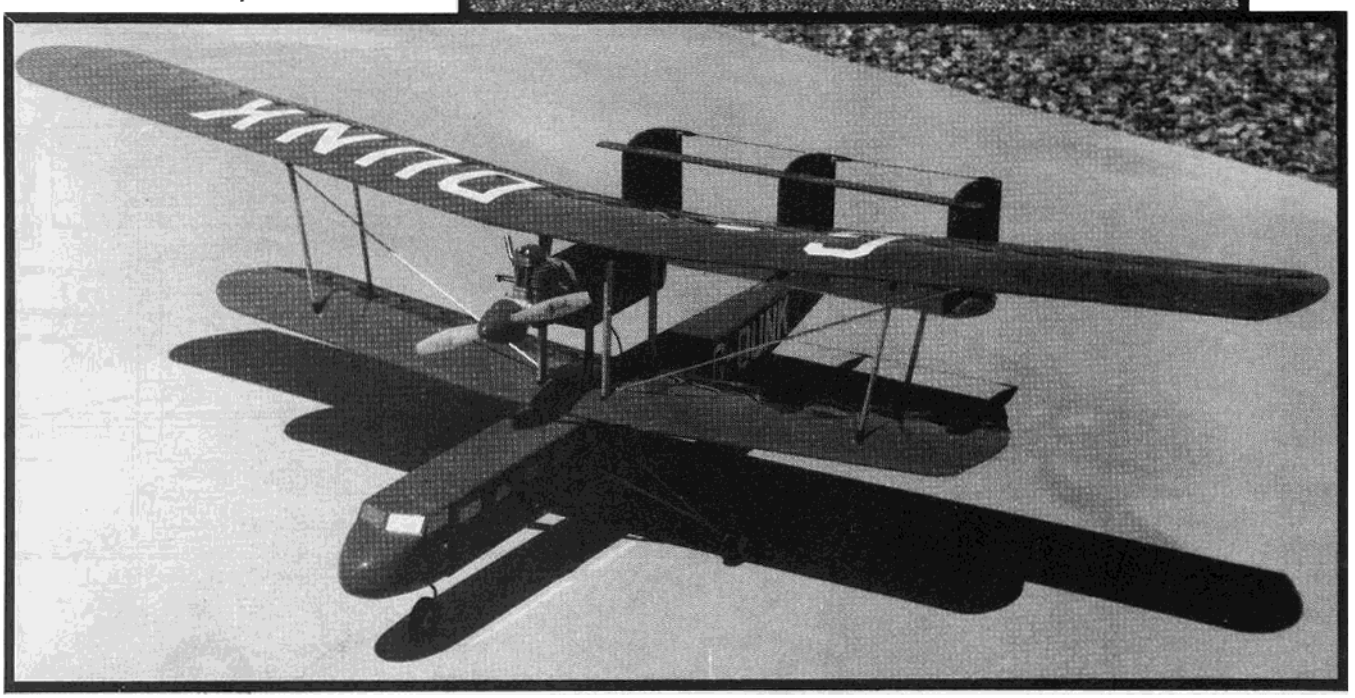


"Whatzit" showing nacelle with two engines.





Views of completed "G-Dunk."



transmitted to the outer rudders using threaded metal pushrods, clevises and plastic "L" brackets. The metal pushrods are the long, soft iron wires threaded on one end. They are cut to length then threads are added to the blank end. The "L" brackets are either hold-downs or 90° brackets, both from Goldberg. We used the hold-downs and cut them off just outside the inner hole. If you are unable to thread the opposite ends of the rudder pushrods, they will work just as well by using a "Z" bend on that end and a clevis on the other end for adjustment.

The outer two sets of interplane struts are more decorative than functional. They are made from 1/4" x 1/8" pine or spruce. A right angle aluminum tab is inserted in a slot sawed in each end of the strut and held in place with epoxy. The flat portions of the tabs are screwed to anchor blocks built into the tops and bottoms of the wings. We cut 3/4" pieces of 1/4" diameter heat shrink tubing and shrunk them to the ends of the struts for decoration and to cover the slot. All wooden struts were given two coats of clear varnish.

There is also a pair of flying struts which attach to the bottom wing and go outboard to a position on the upper wing. A 36" piece of 1/8" diameter aluminum tubing was cut in half to make the struts. A 3/4" length of 3/32" aluminum tubing was inserted into each end of the strut to act as a doubler then the ends were squeezed flat in a vise and drilled for a #2 sheet metal screw which attached the strut to the center spars of each wing. These struts could just as well have been made from spruce or pine with aluminum fittings on each end. Decorate with heat shrink tubing and varnish for protection against fuel and oil.

Final Assembly:

Mount the top wing to the upright center cabane struts using 4-40 machine screws through the hole in the strut tab and screw tight to the blind mounting nuts. Slide the nacelle in-between the struts. Measure its location carefully up from the top of the fuselage so there will be 0° incidence in relation to the fuselage. The throttle servo wires pass through the bottom sheeting of the nacelle and enter the fuselage through a "U" shaped notch carved in the deck just behind the wing. Here it plugs into a servo extension to the receiver.

The flight pack battery is mounted in the nose, with the wires passing

through former #1 to the switch which is mounted behind former #1 on the left side. We found the only extension cord necessary was the one to the throttle. The radio is at the rear of the front compartment while the elevator and rudder servos mount just beneath the lower wing. This distribution of weight makes G-DUNK balance exactly on the Center of Gravity. No weights or flight trim was necessary.

Flying:

The first engine we used in G-DUNK was an O.S .25 FSR Schnuerle and we found ourselves flying around on 1/4 throttle most of the time, so we removed the .25 and replaced it with one of the new O.S. .20 FP engines. With this engine we were flying mostly on 1/2 throttle except on take-off. We have now flown the G-DUNK with an O.S. .20 4-stroke engine and it works great.

Whatzit (one pound heavier) was flown originally with a standard O.S. .20 but Bob felt it was slightly underpowered so he replaced it with an O.S. .25 FSR Schnuerle. When he added the Cox .15 as a pusher, he put the .20 back on the front. This was just great until the .15 ran out of fuel, then performance was marginal. So back came the .25. If your G-DUNK comes out weighing near what the prototype did, there is no reason why it cannot be flown with a .20 engine.

This little plane has many possibilities. You can install a variety of engines, both 2-stroke and 4-stroke and it may be flown as a tractor or pusher or both. With as much room as there is in the fuselage, the space could be used to carry an object or be set up for a bomb-drop. As long as you are going to add another servo, why not put strip ailerons on the bottom wing. Both the G-DUNK and the Whatzit have logged many hours of flight and we have not seen a three channel plane this stable for a long time. It is a real pleasure to fly, and we guarantee there will be a multitude of questions asked about it when you show it off for the first time. □

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