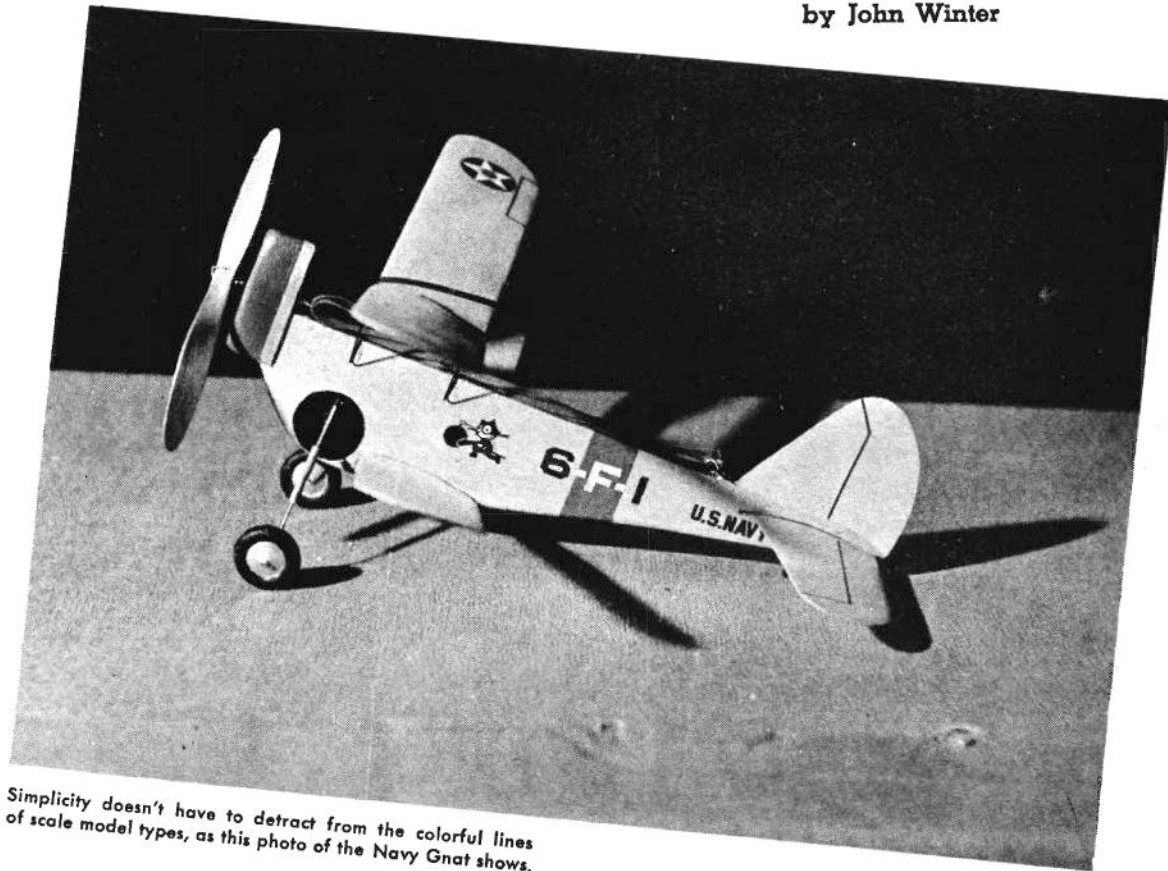


NAVY GNAT

Tiny rubber-powered models provide many hours of fun for sport modellers

by John Winter



Simplicity doesn't have to detract from the colorful lines of scale model types, as this photo of the Navy Gnat shows.

● Back in the heyday of the biplane, (otherwise known as "the dear dead days beyond recall") deck fighters such as this Grumman F3F-2 were the glamour planes of the fleet. It was impossible during the middle '30's to pick up an aviation magazine without seeing one or more pictures of carrier planes taking off, stalling in over the stern or flying wingtip to wingtip in flawless formation.

At first glance, this lil' eyecatcher, colorful though it is, may seem a little

small and stubby to really perform in the air but such is not the case. You'll draw a bigger crowd at the local school yard with this model than a philanthropic Good Humor man. It's a natural for youngsters, being practically indestructible (unless you persist in flying in the vicinity of nervous buffalo). The afternoon we went out to test fly, our Gnat really got a workout. The "bugs" were scarcely ironed out when we weakened to the pleas of "Kin I try her onc't, Mister, huh, kin

I?" And before darkness fell and we regretfully headed for the old station wagon, no less than five little Lindberghs had successfully soloed.

You've probably got enough material in the old scrap box (as these articles always say but nobody really does, so go out and buy the stuff like I had to) and start building—else, how you gonna fly tomorrow after school or work, as the case may be.

Construction is not difficult and a
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modeller with a few flying models (from the magazine of the same name, of course—The Editor) to his credit can probably grind out a Gnat from the plans alone. But for you recently converted stamp collectors, there follows several hundred words, wise and otherwise, outlining the building procedure: Hack out the fuselage from some nice $\frac{1}{8}$ " sheet balsa, not too hard, and cement on the prop shaft tubing, noting that it should tip down $\frac{3}{32}$ " at the front, providing downthrust to prevent a stally, loopy flight. Cement a second time, binding fast with a small silk patch to insure permanence. Before cutting the curved slot at the tail, it would be wise to make the tail surfaces so you can use the stabilizer as a guide for slot width. A snug fit is important as you will discover when adjusting for flight. Do not cement the stab in place or our Gremlins will come around some night and uncap all your dope bottles and then you'll be sorry.

While the $\frac{1}{32}$ " sheet balsa is at hand, cut out the four wing panels and curve the airfoil section into them (by pairs) by wetting the top surfaces and smearing bands of cement chordwise on the lower surfaces. The resulting expansion and contraction should do it.

Test the fit at the wing roots where they butt together and trim if necessary so when joined the necessary dihedral (or tip rise) is formed and the joint is so tight that an undernourished balsa bacillus couldn't squeeze through (and you know how small

THEY are). Pre-cement these joints and allow to dry before the actual cementing and jointing. While waiting for various things to dry, you can be bending the wire parts out of .040" music wire obtainable from your neighborhood piano- (correction) hobby shop. Make sure the front wing clip is $\frac{1}{16}$ " higher at the wing attaching point than the rear clip. This automatically provides "positive incidence" and keeps the plane from making like a shot-put when launched. You will probably have to shift the top wing fore and aft for best flight pattern so check the clip grips on the fuselage while forming them. Leave the center bend on the landing gear quite open. When installing on the body you can then thread it through an oversized hole and crimp it down tight with long nose pliers, bedding the wire in plenty of cement.

Mark out position of lower wing on fuselage noting the $\frac{1}{16}$ " of positive incidence and make a curved cut finishing with a vertical cut from each end to remove the section underneath the wing position. Save this to replace after wing is in position. Cement lower wing in place, beveling body for good fit. Fit the rudder and cowl pieces plus wire parts.

To attach top wing to its clips easily, follow this procedure. Press clip on fuselage as shown on plan and place wing on them making minor bending adjustments on the wires until all four attaching points meet wing under surface evenly. Mark this position, remove wing and make a cement skin on each location as well as on wires and allow to dry. Recement and join, sighting against lower wing for final alignment. Either hold in position for a few moments until cement sets or better, prop fuselage up so wing balances on wires while joints harden.

Give all wood parts a light coat of clear dope, a light sanding and proceed with the glamourizing by doping the body silver, tail surfaces true blue (indicating that this plane was attached to the U.S.S. Enterprise) and all indicated areas insignia red. If you have a steady hand, you can add the rest of the marking with India ink and a pen. If your hand is unsteady, do it anyway!

Slip in the prop shaft, add a couple of washers or a bead, slide the 6" plastic or hardwood prop on, bending the wire back in a 'U' shape to retain it, add the 1" wheels with a bead of cement on the axle ends to retain them and after hanging a two-loop motor of $\frac{1}{8}$ " flat rubber between the hooks, you're ready to play test pilot.

Start glide tests with the upper wing clipped on in the position indicated.

If glide is too steep, slide stab forward in its curved slot (see we TOLD you not to cement it), if too stally, slide stab back. The curve imparts a slight lifting surface to the stab that will help control that first burst of power when the motor is wound. If the latitude of adjustment is not great enough in the stab, then shift the wing slightly (using same directions as above) and try again. When satisfied, wind her up 10 turns and launch into the wind, making final adjustments on the tail as needed. Maximum number of winds depends on the condition of the rubber bands and your nerves. Incidentally, we discovered a turn can be had by shifting the stab sideways although it looks a little unbalanced. Try take offs, by all means, but don't expect the wheels to roll much 'cause the Gnat is off in inches.

One last thought. If you install the arrester hook that all good carrier planes should have, watch out for clothes lines.

BILL OF MATERIALS

(Balsa unless specified otherwise)

1— $1/32$ " x 3" x 36" Wings, tail
1— $1/8$ " x 3" x 36" Fuselage, cowl

.040" piano wire; 4 ft. $1/8$ " flat T-56 rubber; pair 1" diameter wheels; colored dopes as necessary; clear dope; thinner; cement; $1/16$ " o.d. tuning; sandpaper; beads; washers; silk; india ink; 6" propeller.

FLYING MODELS for August 1958