

NEW RULE FREE-FLIGHT CLIMAX

BY CHARLES FOLK

HOLDER OF BOTH CLASS B FREE-FLIGHT LAND AND SEAPLANE
RECORDS, SHIP TAKES EITHER DELONG OR FORSTER ENGINE

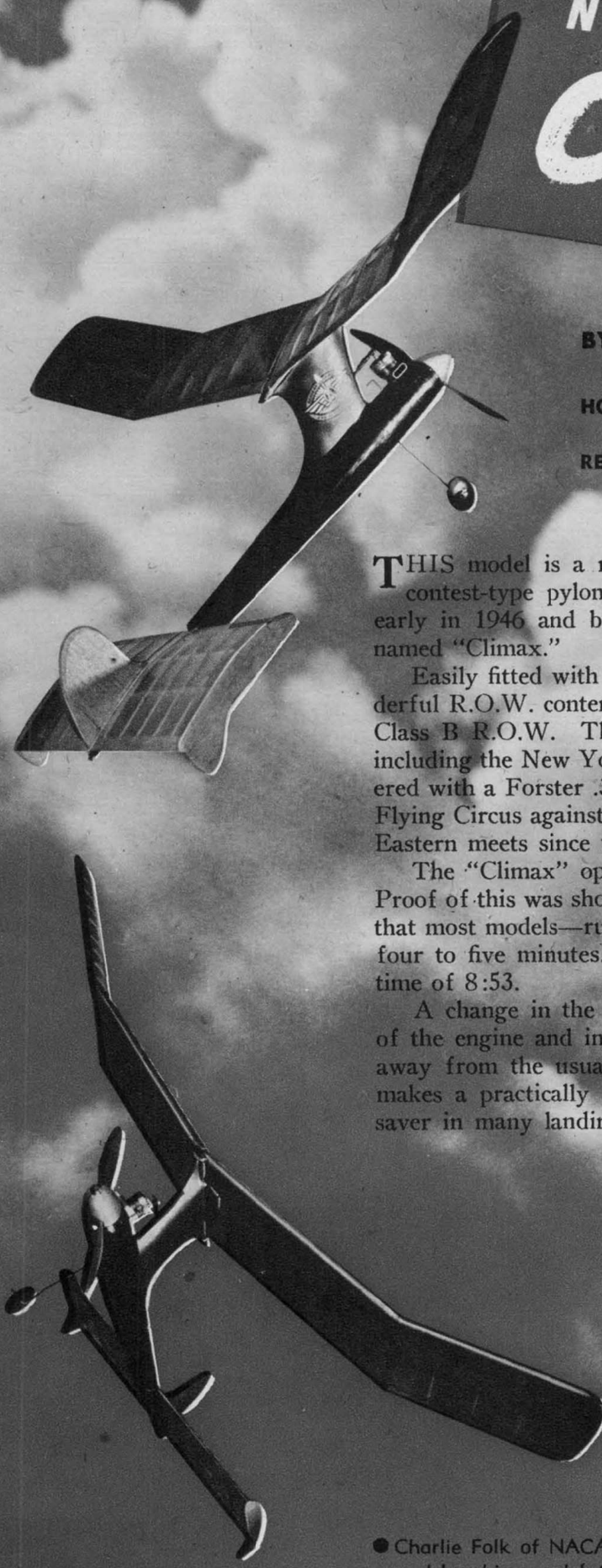
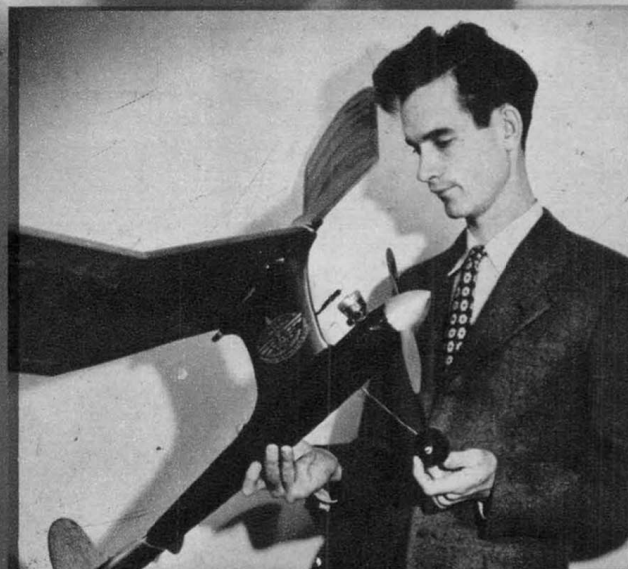
THIS model is a result of several years' experience in building and flying contest-type pylon models. The first of this particular design was flown early in 1946 and because of its outstanding flight characteristics was aptly named "Climax."

Easily fitted with floats of the three-float type, the "Climax" makes a wonderful R.O.W. contender. It holds the present AMA National record in Open Class B R.O.W. The original model placed in the first three meets entered, including the New York Mirror Meet, even though it weighed 35 ounces. Powered with a Forster .305, a second "Climax" placed in Class C at the '46 Philly Flying Circus against the field of larger ships. Both ships have placed in many Eastern meets since then.

The "Climax" operates as well in windy areas as in moderate conditions. Proof of this was shown at the '47 Richmond, Va., meet, where it was so windy that most models—rubber, gas, and towline gliders—were going out of sight in four to five minutes. The "Climax" made the high flight of the day with a time of 8:53.

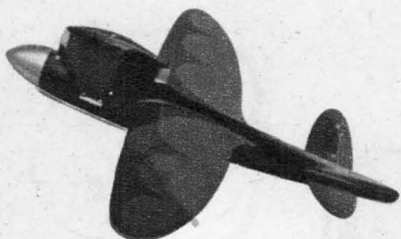
A change in the general run of pylon fuselages was made in the cowling of the engine and in fairing the nose into a $2\frac{1}{4}$ " Froom spinner. This gets away from the usual flat plate area in front, adds to the stream-lining, and makes a practically smash-proof fuselage. The spinner also acts as a prop-saver in many landings. Utilizing a large lifting stab, short (Turn to page 80)

● Charlie Folk of NACA and his record-breaking model. On first 6 flights in '48 ship did better than 1 hour total time. Full size plans are available from Air Trails for "Climax"—see notice, page 96.



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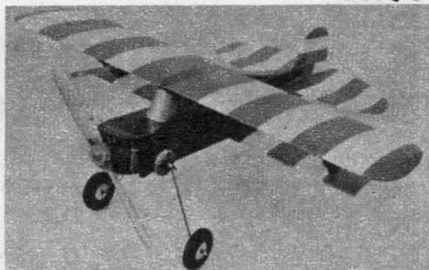
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CLIMAX

tail moment arm, and a medium small rudder the "Climax" has the best flight pattern possible for contest work. Under power the model will R.O.G. beautifully, heading up and to the right immediately after release, and will continue to spiral upwards until the motor cuts, when it will change to a flat turning glide without loss of altitude. Full info on the uncanny flight arrangement is given later with flight adjustment tips.

Many short cuts in building time are given in the following instructions. Read them carefully before starting construction of your "Climax."

From dimensions on the drawings, lay out the fuselage profile on your work bench. This should only take a few minutes as the longerons are symmetrical about the fuselage center-line. Note that the forward pylon upright is longer than the aft upright, providing for $\frac{3}{16}$ " positive incidence in wing. All horizontal

dimensions are given from rear of spinner. Pin down the top and bottom $\frac{1}{4}$ " sq. longerons over the layout. Successive models used $\frac{1}{4}$ " x $\frac{1}{2}$ " rear pylon upright instead of size shown on plan for simplicity. If you do this thin down pylon rib P-1 trailing edge to $\frac{1}{4}$ ".

Cement the compression members in at stations $12\frac{3}{4}$ and 17. Notch the upper longeron for the pylon uprights and cement them in place. Take up the frame at this point and locate the $\frac{1}{4}$ " plywood formers and former F-4 as indicated.

Next slide the hardwood motor mounts in place. The ear overlapping the mounts on the plywood formers may be removed and cemented in place after the mounts are located, if so desired. When a motor other than the DeLong "30" is used, be sure to re-plot position of motor mounts on the firewall so they will be in such a position as to bring the motor shaft on

the fuse center-line. A Forster .29 or .305 cowls in much easier because of more room above the mounting lugs. When using a Delong the tank must be shortened about $\frac{3}{16}$ ". This may be accomplished with a hacksaw if a lathe is not available. After sawing, file the edge flat and clean the tank well before replacing it.

Complete the pylon leading edge by cementing $\frac{1}{4}$ " x $1\frac{1}{2}$ " sheet to both sides of upright, lapping it over both the top and bottom longerons. Trim top of uprights for good flush joint with the $\frac{1}{4}$ " x $\frac{3}{4}$ " pylon top, cementing this next. Note the pylon top is long enough to clear the wing $\frac{1}{2}$ " at each end so that wooden or wire pins are not necessary to hold the wing rubber. Leave the pylon at this stage and install the landing gear according to the drawing, or use your favorite installation method.

The next step may seem a little premature at this stage of construction, but will save headaches later. Cut away the forward pylon upright to accommodate the spark coil, cementing it flush with rear of firewall. The high tension wire goes into the pylon and out the leading edge at spark plug height. Use a paper condenser with stranded leads, placing it above the coil. Complete the entire wiring job, soldering all joints, and leaving wires to the battery box and timer long, so they may be cut off to proper length later. Solder ground wire to one of two brass plates which retain the motor mounting screws. Solder screw heads to plates on underside of motor mounts. After the wiring is completed, with the exception of timer and battery box, put on both side longerons with cross braces between them of the same length as the upright cross braces (compression members).

Cut out formers F-1, F-2, and F-3, making four of each, and cement them in place. Place the $\frac{1}{16}$ " x $\frac{1}{4}$ " strips between the longerons, forming the diamond shape for the rear of fuse. Plank both top sides, using medium soft $\frac{1}{16}$ " x 2" sheet balsa. Pull planking down well on all edges, using pins to hold it in position. Pulled down properly, it should fair in nicely from the perfect circle in front to the diamond shape of the aft section.

Construct a battery box from $\frac{1}{16}$ " plywood with inside dimensions of $\frac{9}{16}$ " square by $4\frac{1}{2}$ " long. Use a sheet brass plate in each end of battery box and a small compression spring on the negative end, which should be toward the rear of fuse. Most hardware stores carry an assortment of springs from which can be chosen a few good battery box springs. Cement the battery box and Austin timer in place next, cut off excess wiring to proper length, and solder these connections. Plank both bottom sides. Put in filler sheet between side longerons to finish stabilizer saddle.

Complete the pylon by inserting the four ribs, P-1, and planking over them with $\frac{1}{16}$ " sheet. Cement the wing seat on pylon top and reinforce with a strip of crinoline or heavy fabric across the seat. Use balsa fairings under both sides of wing seat. Pylon fairings go on next, then the cowling. Carve the cowling from balsa blocks, carefully fairing it in with the $2\frac{1}{4}$ " Froom spinner. Bottom half is ce-

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over. Field repairs are a cinch and replacement parts are readily available. *You* learn to fly easily and quickly because you spend your time flying—not building. For practice flying—put on a larger prop and hold engine speed down until you learn to handle it properly. Recommended propeller size is 9x6.

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mented on permanently. The top half may be made in one piece, slipping down over the motor and held down with large dress snaps, or may be made like the original ship, with two halves of the top hinged to the motor mounts at the outer edges.

Trim all fairings down, giving the pylon a good streamline shape. Sand entire fuse, filling in any bad spots with a good wood filler. Talcum powder and dope does the job nicely. Cover the fuse with silk. If silk is not available use the next best thing, nylon or Silkspan. A good filler for the silk pores is Proxylin (glazing putty), which may be purchased at any paint or hardware store, and will thin out with dope thinner. Use about two coats of this or some other good filler, sanding well after each coat. Use 3 or 4 coats of colored dope, sanding after each with #320 wet-or-dry paper. Put on a finish coat and rub it down with #500 wet-or-dry paper keeping paper wet with water while using. Do not dope spinner as it will become scratched and the dope will peel. Be sure to use the dural backing plate that comes with the spinner. When finished you should have a beautiful fuselage which will stand a terrific beating and will weigh enough to bring the ship up to the required power loading without adding unnecessary extra weight.

The wing is very simple and should go together with a minimum of effort as there are no elliptical tips to plot and build and all ribs are the same. The false ribs give a smooth airflow over the wing as there is no sag in the covering between ribs. Use $\frac{3}{4}$ " Jasco trailing edge stock and notch to accommodate the rib trailing edge. Carve the tips from soft balsa blocks and hollow them out, or carve them completely away on the bottom. Cement the $\frac{3}{8}$ " sheet wing seat pad between the inboard ribs at the center section to match the wing seat on the pylon. Cement $\frac{1}{16}$ " sheet balsa between the first ribs on the top only. Wing is covered with dyed Silkspan. (A 15¢ package of Pagoda Red Tintex will dye a dozen sheets beautifully. Follow dyeing instructions on the package.)

The stabilizer construction is practically warp-proof, an important factor for a ship using a large lifting tail. Using a 22" leading and trailing edge, pin them down to give an 8" chord. Connect them with $\frac{1}{16}$ " x $\frac{1}{4}$ " strips with a 2" spacing between them and a $\frac{3}{8}$ " sheet rib at each end. Cement the spars on top of strips next, and bend the same size strips over the spars to form the airfoil section. Hold them down with pins while cement is setting. Cut end plates from $\frac{1}{16}$ " plywood and cement to end ribs. Plank top and bottom of center section, and cut a $\frac{1}{8}$ " wide slot in the top to accommodate the rudder which slides through and is cemented to the bottom sheeting and the spars.

Use $\frac{1}{8}$ " sheet balsa for the rudder. Be sure to make a good workable tab, using soft iron or copper wire for hinges. Holding the complete tail assembly to the fuse with rubber or pins, carve a balsa fairing block flush with fuselage.

The "Climax" should balance near the wing trailing edge with all equipment placed properly. Test glide the ship on a

calm day in high grass, if possible. Cock the stab up just a little to the right to give the ship a flat right turn. Eliminate stalling tendency, if bad, by shimming under the stab leading edge. Glide your ship until you are well satisfied with the results; it will pay off later.

Set the timer for 7 to 10 seconds when you are ready for powered flights. Lean the motor down to where it just breaks into two-cycling with a low timer position for the first few hops, gradually increasing the power, if no spinning characteristics develop. Spinning in to the right is eliminated by a little left tab, if needed. The ship should climb and glide to the right. When the climb is good and a slight stall is noted in the glide tighten up the turn by cocking up the stab to the right more.

The glide should have a very tight and very flat circle, in fact the tail should skid around slightly in the turn. That is the secret of the amazing glide which can be had with the "Climax." The speed of the ship is at a minimum with the surfaces almost stalled. It will bounce around on any slight thermal or updraft, and will stick in the smallest thermal over the field, while the ordinary model will glide right through the thermal getting very little benefit of the rise, if any. If the glide of the "Climax" were straightened out, a violent stall might appear. Of course, with other adjustment this could be eliminated—but for the best in contest performance keep the glide slow and flat.

Don't underestimate the power of adjustment in cocking that stabilizer. Once the technique is mastered you will have no trouble climbing and gliding your ships in the same direction without having them wind in under power. In using this arrangement there will be no dip when the engine cuts, as the ship will just swing around on the wing tip and level out.

A word of caution—when increasing the motor run to 15 or 20 seconds use low power again until you are sure the ship won't develop a winding tendency with the longer runs. If it does, give it just a little more left tab. To retain the original flight pattern then it may be necessary to raise the stab a little more to the right. Above all, keep your "Climax" skidding around in tight circles in the glide.