

Author/designer Mark Fineman releases the stubby little CR-3 for another stable flight.

CESSNA CR-3

By MARK FINEMAN . . . Winner of several F.A.C. Thompson Trophy competitions, and flying well enough to go O.O.S. at the 1982 F.A.C. Nats, this stubby racer is a real performer . . . once trimmed.

- There are certain airplanes that I think of as "brutes," usually radial-engined jobs that look like airborne powerplants with airframes tacked on as an afterthought. Of course the Gee Bee racers fit this description, but so too do some lesser known Golden Age racers, such as the subject of this article, Cessna's strictly business little powerhouse, the CR-3.

When the Flying Aces Club's mass launch air race events came to be dominated by inline ships, particularly the Chambermaid, the FAC high command modified the rules so as to limit the Thompson Trophy to radial-engined aircraft and the Greve Trophy to inlines. Radial-engined planes, with their generous frontal cross sections and short nose moments, present similar problems to both the designers of real

aircraft and to model builders. Since these competitions are limited to scale models of planes that actually raced, when the rule change was announced, modelers had a tough job of picking an appropriate subject.

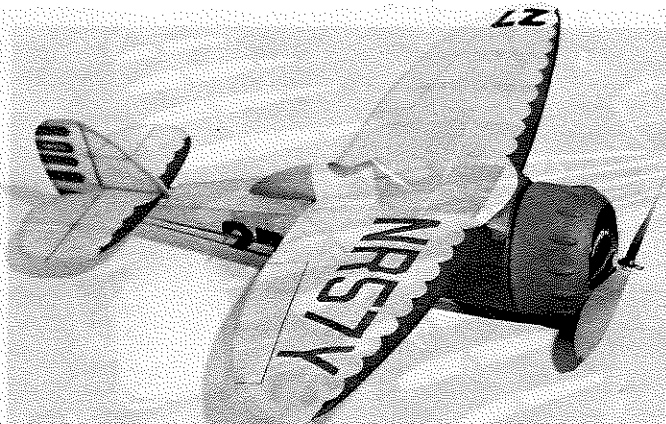
The CR-3

Although we usually think of Cessna as primarily a manufacturer of light-planes, for a short period in the mid-'30s they were deeply involved in the national mania called air racing. The CR-3 was the last of their custom built racing ships, and was created especially for Johnny Livingston of Monocoupe fame. The little red-and-yellow speedster was powered by a 145 hp Warner radial encased in a tightly fitted cowl with raised rocker arm blisters. In its brief career, the CR-3 won every race in which it was entered and established a new world's speed record for aircraft of 500 cubic inch displacement, 237.35 mph. Its career, alas, lasted little more than two months, when Livingston was forced to abandon the fiesty little ship after its landing gear failed to come down on a flight to Columbus, Ohio. The pilot went safely over the side, but the CR-3 augered in at several hundred miles per hour.

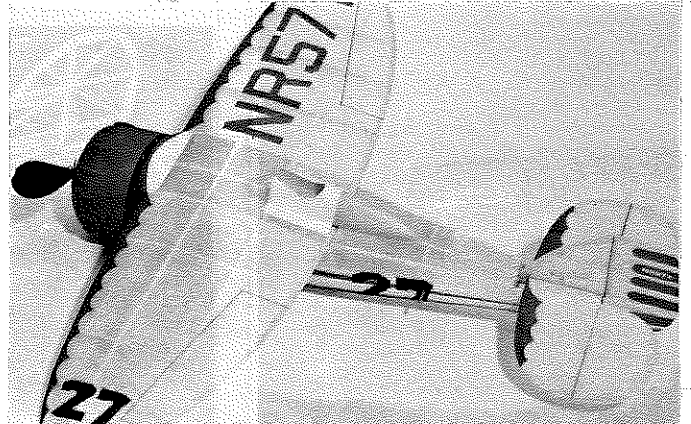
The Model

The history of the CR-3 model is almost as intriguing as that of the real racer. Several years ago, Dave Stott designed a Peanut CR-3; a good looking little bird that never quite lived up to its promise. When the air race rules were modified, FAC competitors scrambled for appropriate subjects, only to find that existing plans suffered numerous shortcomings. FAC pilot John Stott scaled up the Peanut plans of Uncle Dave, making appropriate modifications along the way. His CR-3 was no small success, capturing the Thompson Trophy at the first modified-rules competition and at the 1980 FAC Nationals. John, like many scratch builders, had not made meticulously detailed plans, and those of us who wished to duplicate his successes were left to our own devices.

John's model spanned 24 inches and was a devilish handful. Its fuselage was so large in diameter that his "mechanic" needed two hands just to hold on to the peg while John cranked in the turns . . . and when that wad of Pirelli occasionally disintegrated, the spectators were treated to a sight reminiscent of Johnny Livingston's racer excavating a hole at 400 miles per hour!



Strictly business scale model. After two years, the cockpit was still not detailed.



This model is somewhere around Johnsville Naval Air Station, Pennsylvania, where it flew O.O.S. during 1982 F.A.C. Nats.

Although my version of the plane was also based on an enlargement of Dave's Peanut version, it was slightly smaller than John's (22 inch span), sported a different airfoil, enlarged tail surfaces, and more robust construction. As the air races are not strictly scale events, I tried to make my model sharp looking but without slavish attention to detail. After more than two years, I still haven't gotten around to detailing the cockpit!

Although the model was completed in time for the '80 FAC Nats, it took another two months of fooling around to trim her out, including the construction of two enlarged tails. But by the Fall of 1980, it was flying well enough to capture the Thompson Trophy at our Fall meet, a feat that was repeated in 1981. This model is not for the inexperienced or the faint-hearted. It required a great deal of patient trimming, and, for reasons bordering on the supernatural, has shown a fondness for landing in trees ... very high trees at that ... but with those two trophies now on the shelf, I have forgiven her these eccentricities. Perhaps my accumulated experience will make things easier for you.

Building the Model

Fuselage: This is constructed using the familiar half-shell technique. Although most of the stringers are 1/16 square, the upper "backbone" and top-and-side stringers are 3/32 square stock. All of the stringers, as well as the 1/16 sheet bottom keel, should be stripped or cut from firm balsa. Only the general locations of the stringers are indicated on the former patterns, because a neater job will be achieved by notching the formers as you go along. Note that Former 3 is doubled and cross-laminated. A 3/32 square wing rail is added to the completed fuselage between Formers 3 and 6. The wing rail may be tapered if you wish to build in some wing incidence.

The cowling is of composite construction. It is best made as a separate unit and then glued to the fuselage after both have been finished. Begin by making a drum-like structure with 3/32 square stringers, top and sides, and 1/16 square stringers between, from Former 1 to 2. The front of the cowling is made up of several circles of 1/8 balsa, cross-laminated, the last few of which make up the dummy cylinders and crankcase; the nosebutton is an integral part of the latter structure (see photos for the details.) I found it necessary to incorporate a rubber band noseblock hold-down in order to insure that the prop assembly would not slip out at an inopportune moment during a race.

The "drum" is covered with stiff paper, after which the front of the cowling is sanded to the correct contour. The rocker arm blisters are tedious to make from scrap, but are authentic and a nice touch besides. The completed cowling was given several coats of sanding sealer and sanded with 400 grit paper between coats before being

painted. The cowling has never been damaged, even when the model has dived straight in.

Tail surfaces: These are quite straightforward. In order to keep the tail surfaces reasonably light, I used 1/16 inch stock for both the sheet outlines and the supporting members. Consult the plan to distinguish between 3/32 x 1/16 components and those that are simply 1/16 square. When the fin-and-rudder structure has been assembled, use scrap to build up the lower portion so that it conforms to the fuselage contours. The tail surfaces are made in such a way that a generous stab slot remains for adjustment purposes. After trimming, the slot can be tissueed over.

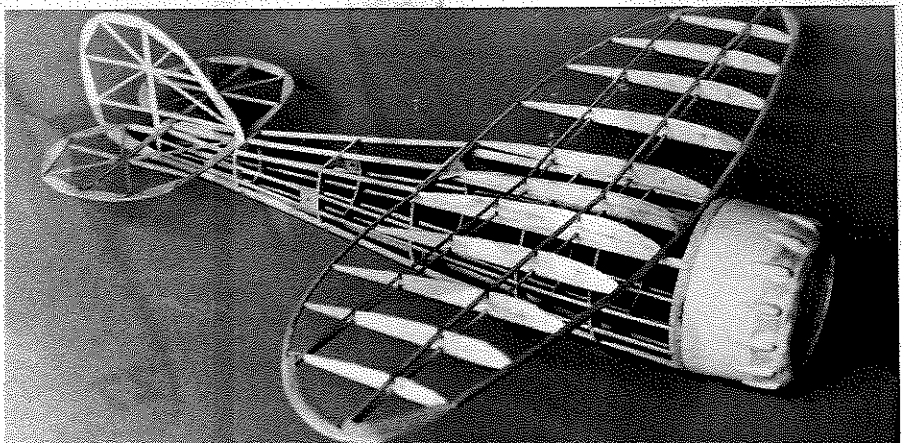
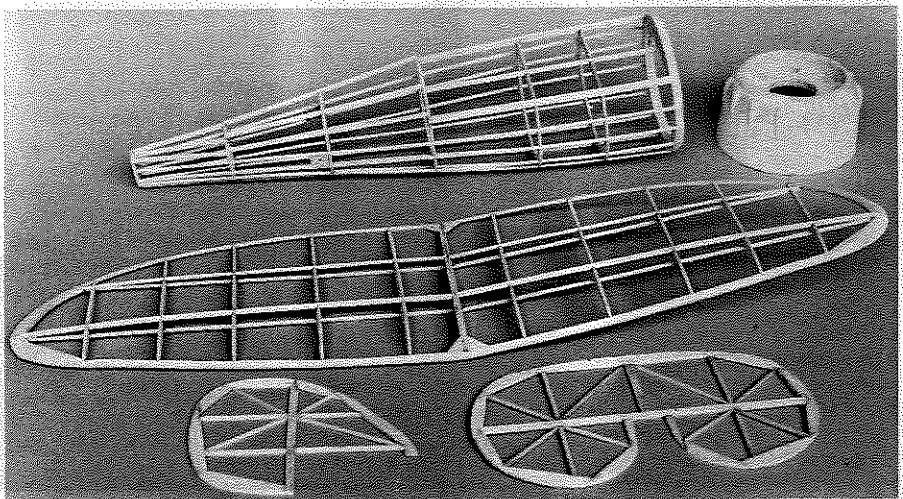
Wing: The trailing edge is made from two lengths of 1/16 square stock laminated together with thinned white glue. A similar procedure may be followed for the leading edge, using two 1/16 x 1/4 pieces, even though I had used a cut piece of 1/4 inch sheet on the original. The remaining construction is conventional.

Finishing: Except for the cowling, which is painted red, the entire model is covered with yellow tissue. As durability was a more important consideration than weight, the model was covered with domestic tissue, not Japanese tissue. The red trim (side stripes, wing

and tail scalloping, and wing registration numbers) was accomplished by doping red tissue directly to the yellow base. The same was true of the black "27" race numbers on the wings and fuselage sides. You may want to make peg anchors at fuselage Formers 7 and 8 in order to experiment with their effects on the flying characteristics of the finished ship. The wheels, of course, are in the retracted position, which was simulated with black tissue semi-circles and inked pants outlines. Control surfaces were likewise inked with a .5 mm technical pen.

Flying

My CR-3 uses an 8-inch plastic prop and is flown on four strands (two loops) of fresh 3/16 SIG rubber, 30 inches long. Trimming, as suggested earlier, was something of a nightmare. My model required about two degrees of negative stab incidence and a small amount of noseweight (don't forget that the cowling was deliberately made to be heavy). In addition, several degrees of down and right-thrust were shimmed into the noseblock in order to get the craft to fly right under power. Just remember that the real CR-3 exhibited dangerous instability and vibration on its early flights. The problems were corrected in the racer and they can be in your ship, too.



After losing the CR-3 at the F.A.C. Nats, Mark immediately got to work on a new one, and so we are privileged to have these skeleton photos.