

FUN TIGER

by D. R. HUTSON

*a medium sized sport/aerobatic model
span 54 in. for .35 to .40 motors*

HERE IS A MODEL that was designed specifically as a low-wing trainer. The idea was for something to supersede my much-modified *Tauri*, which had a Merco 35, shallow dihedral and strip ailerons. I wanted to fly a low winger but *not* the 10c.c. big chaps, at first, at anyrate. Unable to find a suitable existing plan, I had to sit down and dream up my own, which resulted in *Fun Tiger*.

The features I felt I wanted were as follows: first, a semi-symmetrical aerofoil section for the wing—the stall being less tricky than with a fully symmetrical section. (*Not necessarily so, though a generally held belief—there are other considerations!—Eds.*) Secondly, a structure that could be built very light which, again, would help to produce gentle stall characteristics. (*Again—what is obviously meant here, is that the stalling speed will be lower—this doesn't necessarily mean that the stall characteristics will be gentle—Eds.*)

I used inset ailerons because I have found them to give less trouble than the strip types, in that they do not warp, and also that one can see at a glance exactly how they are set, relative to the rest of the wing. A full-span, one-piece elevator was employed, to obviate the possibility of asymmetric elevators, which one always risks

with the joined-two-piece type. This also enabled a more tidy push-rod linkage to be used, as an extra bonus.

Otherwise, generally, I wanted a sort of scaled-down multi-aerobatic type of model, for Merco 35—one that I could make the transition from high- to low-wing flying with, and yet be able to progress to some sort of schedule type aerobatics, without having a screaming bomb on my hands. Then, at a later stage, and when I felt like getting to grips with a .61 up front, I could make the further step, up to the standard aerobatic sized model with much less apprehension.

When complete, the model weighed some 4½lb. I was a little worried when I saw it standing on the runway, ready to be fired up.

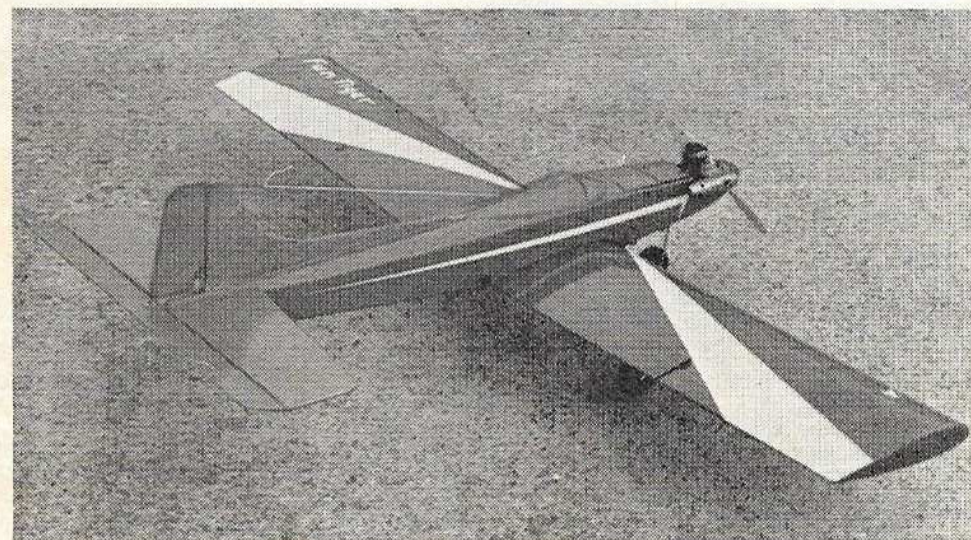
It looked so small. Would it have the characteristics I'd hoped for? Would it fly at all? After all the usual pre-flight checks, engine blipping and general excuse-making, the time came when I ran out of clichés, and gave her the gun. After a run of about 75ft., holding in a little right rudder to keep her tracking straight, I pulled in a mite of up elevator—and *Fun Tiger* was airborne.

I flew the model around for a few minutes, trimming out a slight right-turning tendency, then throttled down the motor and landed. This first landing was a good 150ft. away—but on all three wheels!

I use an exclamation mark here because, having thought that low-wingers were difficult to fly, we

This photo of designer with prototype gives a good idea of the model's compact proportions.





were all more than a little amazed that I had managed to solo without help, and landed the model all in one piece. The slight right turn was eventually tracked down to the $1\frac{1}{2}^\circ$ of right side-thrust which I had incorporated (having been used to high and shoulder-wing models requiring this) and the model flew straight and level in its original trim once this had been removed.

Now that I have flown this model a great deal I can safely say that its flight characteristics are definitely suitable for those, like myself, who want to make the high-to-low wing transition—which is undoubtedly why I got away with soloing first flight, rather than with anything more neutrally stable. The $1\frac{1}{2}$ in. dihedral under each wingtip obviously provides a certain amount of inherent stability, without affecting the model's manoeuvrability too much.

Fun Tiger has a pretty good rate of climb—though it cannot compare with, say, a *Kwik-Fli*, which (I

find!) hardly gives the pilot new to this type of thing time to think!

I can now quite happily perform most of the usual manoeuvres, and have sent along this article and the plans of *Fun Tiger* to your favourite magazine (*flattery will get you anywhere!*—Eds.) so that all those—and I am sure there are hundreds of you!—who feel as I do about not wanting to go the whole hog with a monster .61 motor and large-sized low-winger—will have the chance to do as I did. Not only is this size of model less awe-inspiring, for those making the break from high-wingers, it is more easily transportable—and less expensive to build!

CONSTRUCTION

Wing

Build this over the plan as two separate panels, adding u/c leg bearers, aileron bellcranks and 16g. aileron linkages. Join the two panels, blocking up the tips for $1\frac{1}{2}$ in. dihedral each side (or 3 in. under one tip with the other panel

flat on the board), and fitting the dihedral braces. These are not plywood, but hard $\frac{1}{4}$ in. sheet balsa, which is quite adequate and much lighter. Cover top and bottom surfaces with $\frac{3}{8}$ in. sheet and, when dry, cut out the ailerons. (Do not hinge these permanently until after covering and finishing.) Finally add tips and sand overall.

Fuselage

Commence by cutting the sides from good medium grade $\frac{3}{8}$ in. balsa, adding the ply doublers—using either Evo-stik or one of the aerosol spray contact-adhesives, which are handiest for covering large areas like this. Now make and fit formers F1, F2 and F3, making sure that they are squared up accurately, and leave to set. The elevator push-rod exits through the extreme rear of the fuselage, so the appropriate gap must be left when fitting the fuselage stern-post. Now fit the cross-grain $\frac{3}{8}$ in. sheet fuselage bottom, followed by the $\frac{1}{2}$ in. sheet tank bay bottom, and hatch top. Sand overall, then fit the tail unit, again making sure all is square and true. Double-check before finally leaving to set, that the fin is properly at right-angles to the tailplane, and that the whole unit is correctly aligned in plan-view. (Construction of the tail unit is self-evident from the plan and need not be detailed here.)

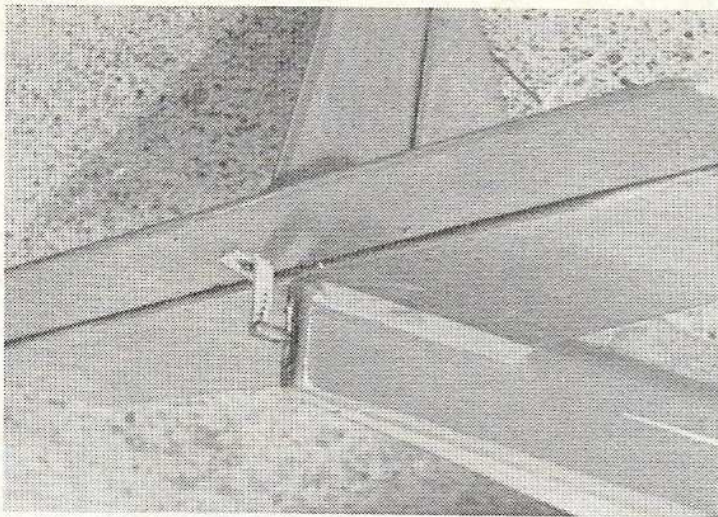
Finishing and rigging

The wing of my prototype was covered entirely with Solarfilm, but the fuselage, tailplane and fin were covered with heavyweight Modelspan tissue, clear-doped and then fuel-proofed with clear polyurethane. The second prototype is Solarfilmed in its entirety and this is the one shown in the photographs.

Trimming and flying

For a nicely stable model, make absolutely certain that you get the c.g. exactly at the position indicated. To start with, use only the smaller of the control-surface movements shown on the plan—you can then increase these later when you are happy with your abilities, and the model's performance will then extend with your own.

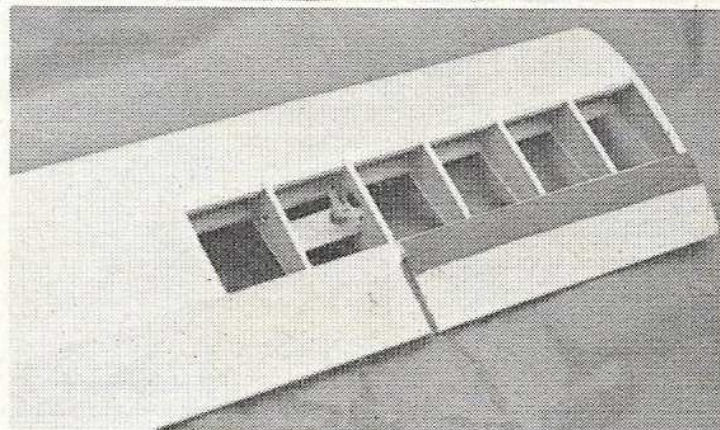
Assuming that you are making the transition, with *Fun Tiger*, from the high-wing cabin type model, or even the shoulder wing types, there are, of course, some differences in flight characteristics to watch out for. The first of these



is that a low-wing machine will tend to put its nose down more in turns. If you are also making the transition from rudder/elevator to aileron/elevator as the *primary* controls, this is especially important. You may still have rudder—but *forget about it* for all general flying purposes, except for take-off corrections, or special manoeuvres like stall-turns and spins. Make your turns by first *banking* the model, with aileron, then turning it by means of *up-elevator*. The sharpness of the turn will be proportionate to both the amount of bank and the amount of up-elevator applied. The trick is, of course, to get the hang of just banking the model enough for the desired turn, and making the elevator work the rest of the time. Too much up elevator will produce a climbing turn; not enough will produce a gradual spiral dive. It is simply a matter of practice.

A good idea, to help this co-ordination of aileron and elevator

These detail photos show the elevator push-rod exit, undercarriage fixing and aileron control exit, and the construction of the wing and aileron bellcrank installation.



to become second-nature, is to keep flying a series of "S" turns. Do these a little way down-wind, and gradually work the model up-wind until it is nearly overhead. Then fly it to the starting position and do it all over again. You will find, eventually, that you are anticipating the model's requirements, and pumping in the correct amount of elevator (a little down-elevator, too, at certain parts of the turn relative to the wind) just a fraction of a

second before it is *seen* to be required. In this way, real smoothness of flight pattern will be ensured.

I don't propose to talk about manoeuvres—plenty of much better qualified people have already done this in detail—but I hope the foregoing has at least helped you a little to make that jump, from rudder/elevator high-wingers, to aileron-elevator low-wingers . . . *Fun Tiger* will do the rest!