

A black and white photograph of a man, Mike Birch, standing in a grassy field. He is wearing a dark racing jacket with two white stripes on the sleeve, a white turtleneck, and light-colored trousers. He is smiling and holding a large model airplane. The airplane has a white fuselage with the number '51107' printed vertically on the side. The background shows a flat, open field under a clear sky.

*mike
birch's*

moonglow

THE first thing I invariably turn to, on the arrival of the latest issue of *R.M.*, is the write-up on the featured multi or scale model, because I probably derive more pleasure from reading the story of such models' development, than from any other aspect of r/c modelling. Now, as I suspect I am not unique in this, I'm going to give you some background on "The Moonglow story" . . .

If we go back about two years—and seven or eight models—we reach the Birch pre-Moonglow era, and find ourselves with a **Thor**, which was really the very start of the line, as it was the first low-wing r/c model I ever flew. ("Snap!"—Eds.). This was powered with a Super Tigre S.T.56, steered with an ancient set of reed gear—and weighed 8½lb. After something like a dozen flights, I planted it in about a foot of very firm Mother Earth.

As the balsa in the fuselage had not sprouted any new shoots by the time I reached the scene, the remains were taken home and stripped down. The wing, which was covered with nylon and painted with cellulose, now had a finish reminiscent of rather fine crazy paving, but was, nevertheless, practically intact. A battered old *Falcon* 56 tailplane was recovered and pressed into service on a new fuselage, together with a *Tauran*-type fin and rubber.

This then, was the first *Moonglow*. It lasted comparatively well, flying for about three months, with newly purchased F & M proportional. Performance was, perhaps, not quite all that it might have been and, on reflection, I have a sneaking feeling that the 3 lb. wing may just possibly have been a contributory factor in this. . . .

The next four *Moonglows* were all built with the *Thor* wing plan-form, but with a symmetrical section—which was actually two "top halves" of the original *Thor* semi-symmetrical section—and, apart from thinning it somewhat, modifying the entry and the maximum-thickness position, this is the section I still use.

Mk. VI characteristics

The Mk. VI *Moonglow* I am currently flying, has now evolved further, so as to have a different wing plan-form and a much longer fuselage, as well as an entirely new tail unit. All of which has hidden the *Thor* points, completely! The section used on the "VI" is the modded one I mentioned, with the maximum depth



point at the tip brought forward from about 45 per cent to around the 25 per cent mark, which allows the wing tips to stall after the root. This being so, the model may be throttled back and flown on full up-elevator and, unless rudder is applied, it simply will not drop a wing tip. However, when rudder is pushed in, the model will spin easily and reliably, and all that's required to stop it is to neutralise the rudder.

The wing which, at 15 per cent,

is quite thick, prevents the model being a "bomb" but, because it can be built at 5¼ to 5½lb., its rate of climb is very good. The long moment arm gives really smoo-o-othe manoeuvres and, of course, the rather massive rudder makes the double stall-turn one of the easier ones! The "VI" performs virtually identically upright or inverted. The ailerons are hinged at the centre, with no differential, and rolls are pleasingly axial. In fact, as one comes to

a really 'winning' design!—

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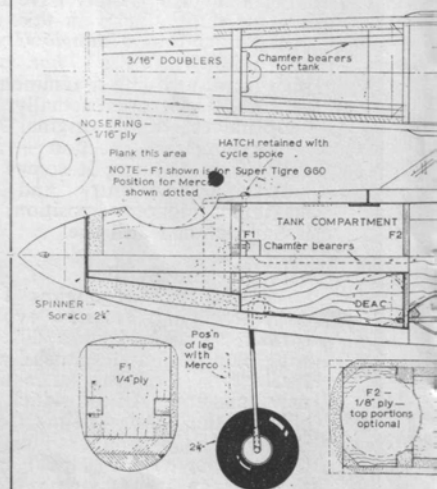
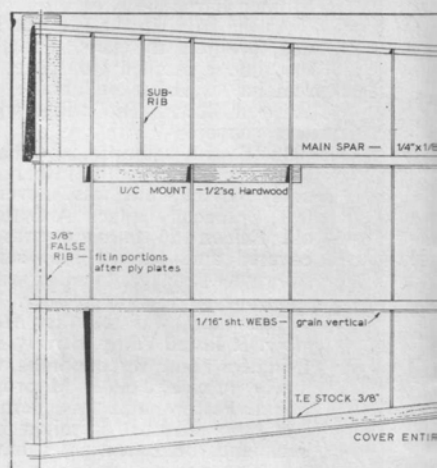
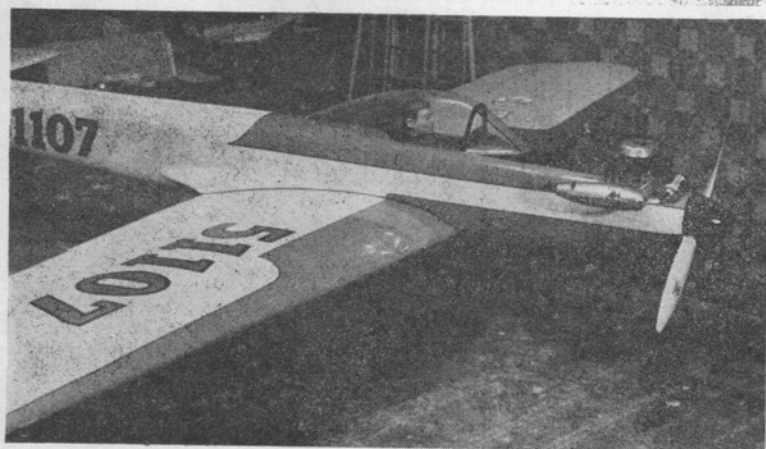
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The lightweight, simple, but pleasing and effective plain wood and colour trim finish, shows up clearly here and in the photos on the previous page. Note the accessibility of all controls, also tank hatch—the practical contest flier's approach! Neat plastic tank filler is the new type available from Mercury. Merco 61 Mk. II has old type silencer—test shows more power with newer "Peak Power Muffler".

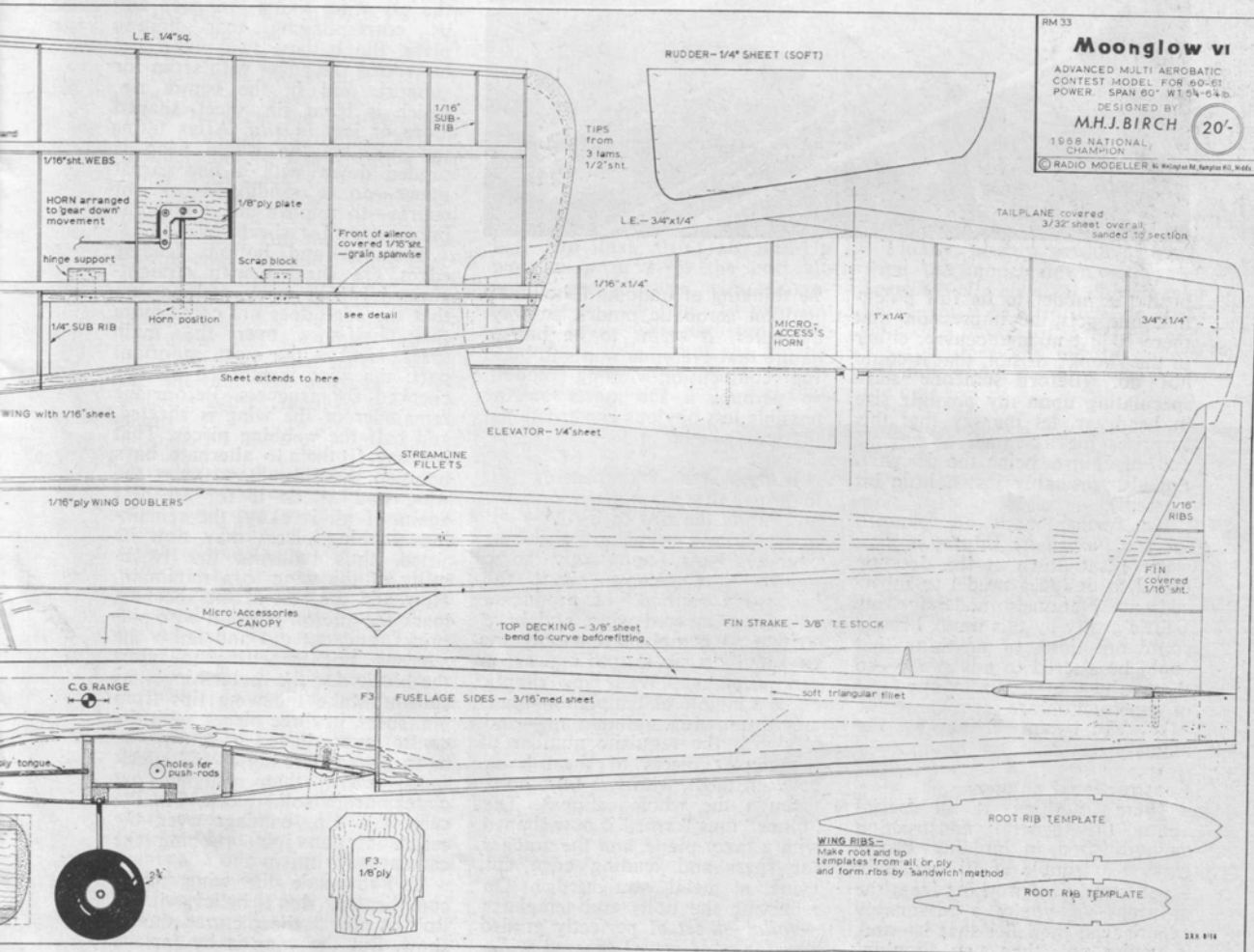
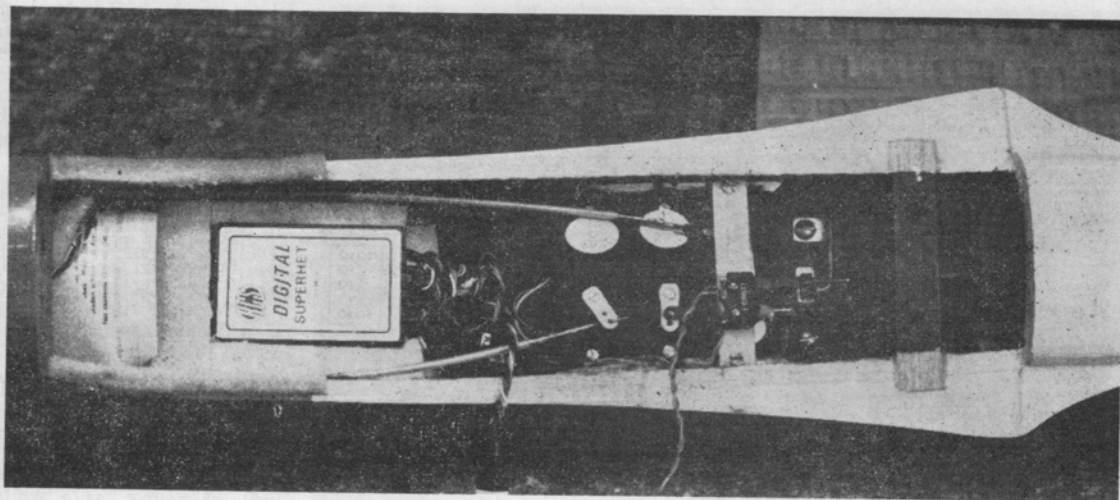


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Moonglow vi

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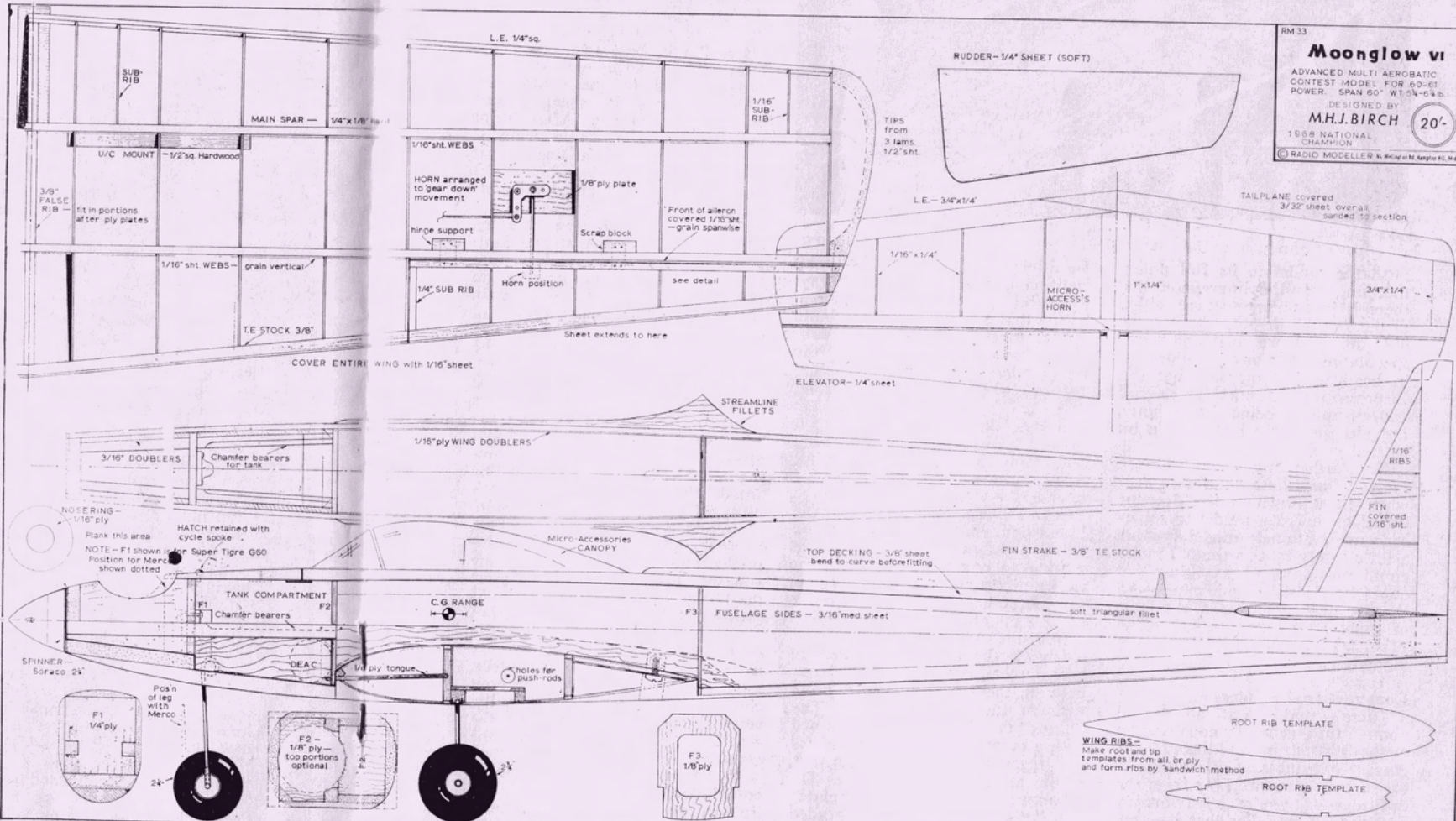
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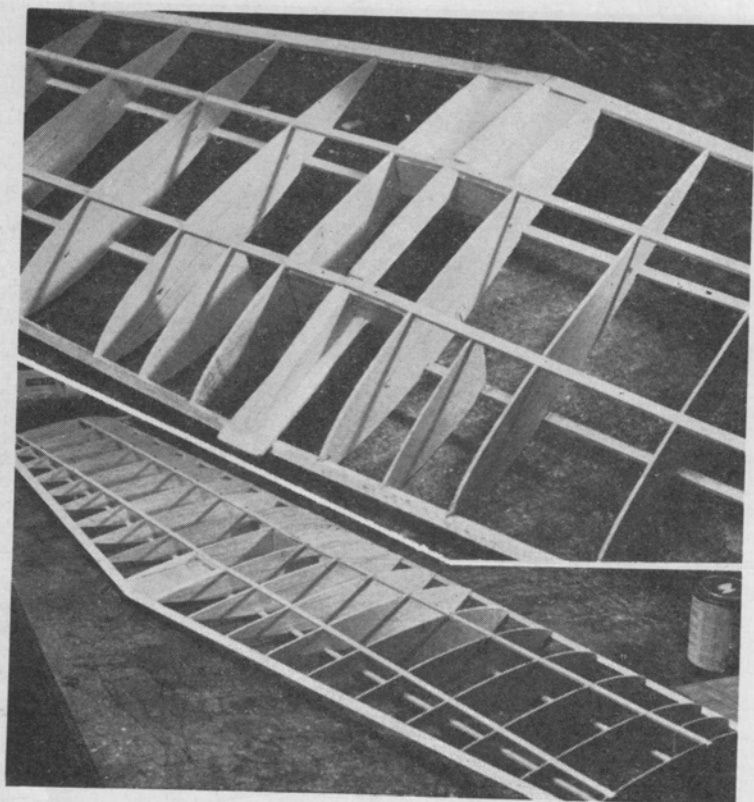
M.H.J. BIRCH

1958 NATIONAL
CHAMPION

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20'





Wing construction details. Close-up shows 3/8in. centre rib which is added after ply 'tongue' and bolt-plate. Note also sub-ribs at root and tip.

The ribs are followed by the rear spar and the leading and trailing edges. When glued, slide a piece of 1/2 in. sheet (you're going to need this later for the fuselage, so don't go thinking it's an extravagant way of wing jiggling!) under the backs of the ribs until the wing panel is true. When set, remove the assembly from the plan, fit the lower rear spar—and repeat the process for the opposite wing panel.

Join the two wing panels with the 3/4 in. balsa joiner, driving small panel pins through the spars to secure them (I hope you used good hard, straight-grained spars!) as well, of course, as a white glue, such as Evo-stik *Resin-W*. Install the ply plates for aileron cranks, the ply wing fixing "tongue" and its corresponding rear bolting plate. Block these two ply pieces in around the edges with scrap for support, and fit the centre rib, which is from 3/4 in. sheet, shaped more or less *in situ*. After fitting the sub-ribs, the whole wing is sanded down with a fine garnet paper—on a sanding block, of course—to remove any high-spots preparatory for sheet covering.

The top and bottom leading edges are sheathed with straight-grained 1/16 in. stock, making sure that the edge does not come more than half-way over the main spars. Next is the most important part; the wing is blocked up and checked for trueness. Before the remainder of the wing is sheathed, add half the webbing pieces. That is to say, fit them to alternate bays, between the ribs. Now invert the wing and check it for trueness again. If all is okay, the remaining webbing pieces may now be fitted, thus reducing the twistability of the wing to a minimum. Now add the rest of the sheathing, mark the aileron position with pinpricks, and cut out and finish the ailerons, not forgetting to insert the blocks for the mylar hinges, as shown. Make the wing tips from 1/2 in. sheet, in three pieces, with the centre layer shaped as shown, so as to give a "pre-hollowed" effect: much easier than gouging out chunks from solid block. Finally, cement a 1 in. bandage over the centre section join, rubbing the cement well in.

If I've made the wing sound complicated, don't believe it. It isn't at all, as the pictures should show. But the wing is by far the

push the model to its full potential, one gets the impression that there is just no manoeuvre, either in the "book" or not, that it could not do. (Before someone starts speculating upon my possible size in headgear, let me say that this surprises me as much as anyone and, of course, being the designer, I'm also probably just a little bit biased!).

No further mods are planned for the *immediate* future; in fact, when I sat down at the drawing board to design a model to supercede my Nationals model (getting a little grotty by this time), I really could not think of anything that could be altered to advantage—so the two new models now in course of construction are identical to the Mk. VI I am flying at the moment.

Constructional pointers

There's nothing at all special about the general construction methods used in building *Moon-glow*. No trouble at all should be experienced, just working from the drawings—if you're a reasonably experienced modeller that is—and, if you're not, then you shouldn't

be thinking of building a hot competition aerobatic model, anyway! However, it seems to be human nature that everyone wants to build the competition-winning models, so perhaps a few notes on the possibly less obvious constructional features will be of help.

Wing. Start by pinning the mainspar down upon the drawing and fitting the ribs to it. (Ah—but first you have to make the ribs, of course.) Now, apparently some readers don't know about the "sandwich method" of producing ribs for a tapered wing, and have written to complain that only the root and tip rib shapes appear on certain plans. Well, you simply make a couple of templates—mine are from 16g. aluminium—and sandwich the requisite number of rectangular pieces of sheet balsa between them, with two 6BA bolts through the whole caboosh. The "block" thus formed is now shaped with a razor-plane, and the notches for spars and leading edge cut, using a metal straightedge. On removing the bolts and templates—*voilà!*—a set of perfectly graded ribs for your actual tapered wing.

most important part of any model and must be as accurate, symmetrical and true as is humanly possible, because the whole performance of the model depends upon this!

Fuselage. After fitting the doublers, bearers and triangular fillet strips, glue formers 2 and 3 in place and, when dry, pull in the rear fuselage sides and pin or clamp together at the tail. Fit the nosewheel fixing to the front former and fix this in place, checking for engine width. Mark off the centre of each former at the top and push modelling pins into them so that, by lining up the pin-heads, it is easy to check the alignment of your fuselage.

You will observe that the top of the fuselage is not a straight line, but a gentle curve, so the $\frac{1}{4}$ in. sheet "top block" decking should be pre-bent to conform with the curve of the top of the fuselage sides. (I lean it against the wall, under pressure, for a few days!)

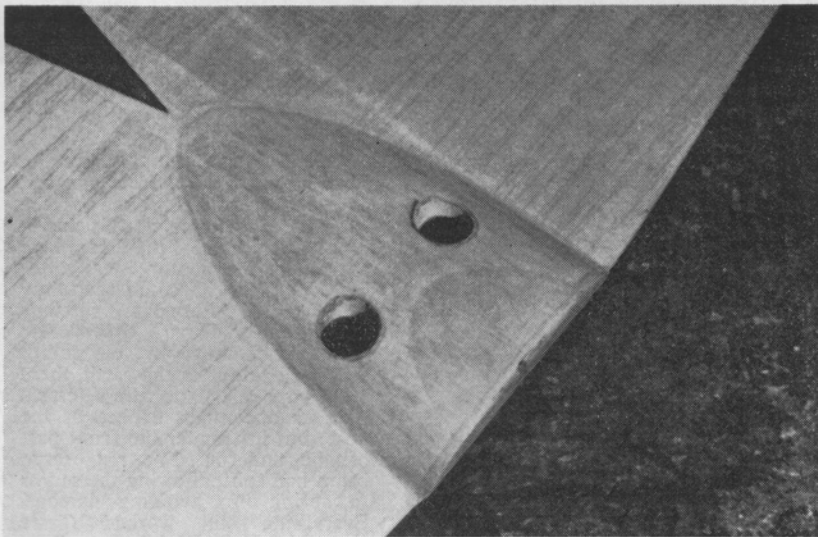
The engine should now be fitted, then the ply nose-ring, and the space between the bearers filled with block in the time-honoured manner, before finally fitting the lower front block.

Check the wing seating fit, particularly in respect of the rear bolting block and the slot for the leading-edge "tongue". Wing fillets are from triangular stock and sanded to shape with the wing in place. Make the lower wing fairings from soft $\frac{1}{4}$ in. sheet and fit the wing bolts. Now make and fit the tail unit—the construction of which is self-explanatory from the plan.

Covering and finishing

Everyone, of course, has his own ideas and pet methods on this subject. Mine is to use heavy-weight tissue (white), clear doped, with just a little colour trim. This system really keeps the weight to an absolute minimum—as well as having that "real modelling" look that the more opaque, or "instant" finishes lack. But, whatever your particular choice of finish—keep it light!

Of the two VT's built so far, the first (with G.60 and 20 oz. gear) weighed 6lb. 2oz. and the second (with Merco Mk. III and 15oz. gear) came out at 5lb. 3oz. The first, incidentally, after about 350 flights and one major repair, finally scaled some 6 $\frac{1}{2}$ lb. and, although it still performed well, you should try to keep the weight to 6lb. or under for best results.



Above: Close-up of the centre section fairing showing recesses to accept wing retaining fasteners. Below: Aileron servo installation detail being additional wires, for electric wheel brakes.

Trimming and flying

The c.g. range is shown on the plan. When the model is placed on a level surface, with the tank empty, it should not *quite* be able to sit its tail down, of its own accord.

I find that an 11x8 Rev-Up wooden prop gives the best all-round performance with *Moon-glow*, as a 12x6 tends to over-rev a little. Other fliers sometimes ask me why I still mount the engine upright. Well, this is a strictly *competition* model, and I feel that,

on the starting line, the easier one makes it for oneself, the better one's chances. This is also why I still fit a hatch above the fuel tank—you can check your "plumbing" easily, without pulling out the radio gear first!

Finally, after a session's flying, wipe the model down well, and *keep it really clean*. It doesn't take long—you'd be surprised—to soak up 4 or 5 ounces of castor oil, and when it does, it's mostly on the tail unit, which is a long way from the c.g.!

