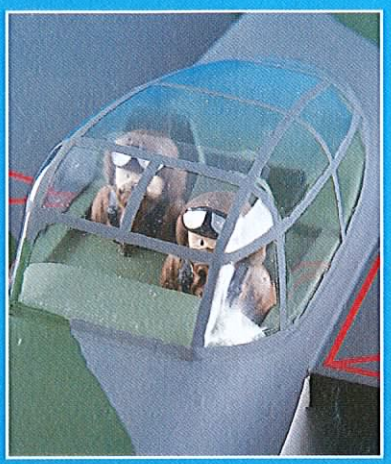
FREE PRO-PLAN

Tony Nijhuis

D.H. Mosquito

TONY NIJHUIS' 2004 WOODEN WONDER WAS A RESOUNDING SUCCESS. HOW COULD HE TOP THAT? SIMPLE - MAKE IT BIGGER!



These small jet pilots from J. Perkins are just the right scale to command the Mossi.

Canny readers may notice that this model has a certain similarity with a free plan that featured in the June 2004 edition of *RCM&E*. Well you'd be right there, but if you're assuming yours truly has done a quick repaint and fooled our esteemed editorial team, you'd be wrong!

What's laid out before you is a 20% larger version of the 2004 design. "But why bother?" you might ask. Well there are three main reasons, the first being the suggestion by quite a few builders of the smaller Mossi who believed a larger version would have more appeal. The second reason concerns stability (the smaller version was prone to torque rolling on launch); being that little bit larger this Mossi has the extra mass to deal with more powerful motors, the 20% enlargement providing the capacity to accommodate standard sub 'C' battery packs. Thirdly, the larger size allows i.c. engines to be accommodated. Even a hardened electric nut such as yours truly can't help but drool over the two lovely little AP 09s shoehorned into the feature model. There's even enough room to facilitate rudder control and to fit retractable undercarriage in the nacelles, if you so wish. Although this would be more of a squeeze on the i.c. version.

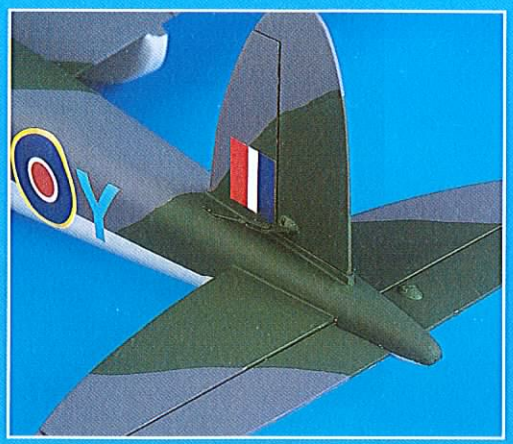
As the original 'Dogfight Double' Mosquito was drawn on AutoCad the re-design was simply a case of hitting the 're-scale' command on the computer, and hey presto. That said, I did have to make some minor modifications, i.e. since the shape of the model was retained, scaling up caused the wood thicknesses to be wrong.

Construction is identical to that of the smaller Mosquito, relying on the tried and tested 'box' style fuselage and 9mm ($^3/_8$") sheet balsa wings.

To get the sleek curves so synonymous of the Mosquito, the trusty razor plane is an absolute must for this model. Both the canopy and scale spinner are available from *RCM&E*, so all the hard work's been done for you there.

Two prototype versions were made, one to prove the model under electric power and one to keep the 'glowheads' amongst us happy - in fact, it was the latter version that was completed first. Initially, the prototype was film covered but not painted, in order that any modifications required wouldn't

affect the final finish. Taking a successful design and enlarging it means there aren't as many unknowns to be encountered as with the original 'scratch' version, so I was quietly confident this larger Mossi was going to be an absolute peach. Okay, preamble over - let's get on with the building.



The tailplane is added once the fuselage has been carved and sanded, whilst the fin and rudder are attached when the rest of the model has been covered.

The nacelles are the last major components to complete. The i.c. version requires 4mm ply bulkheads for retaining the engine mounts, whilst the electric version uses liteply bulkheads.

WING

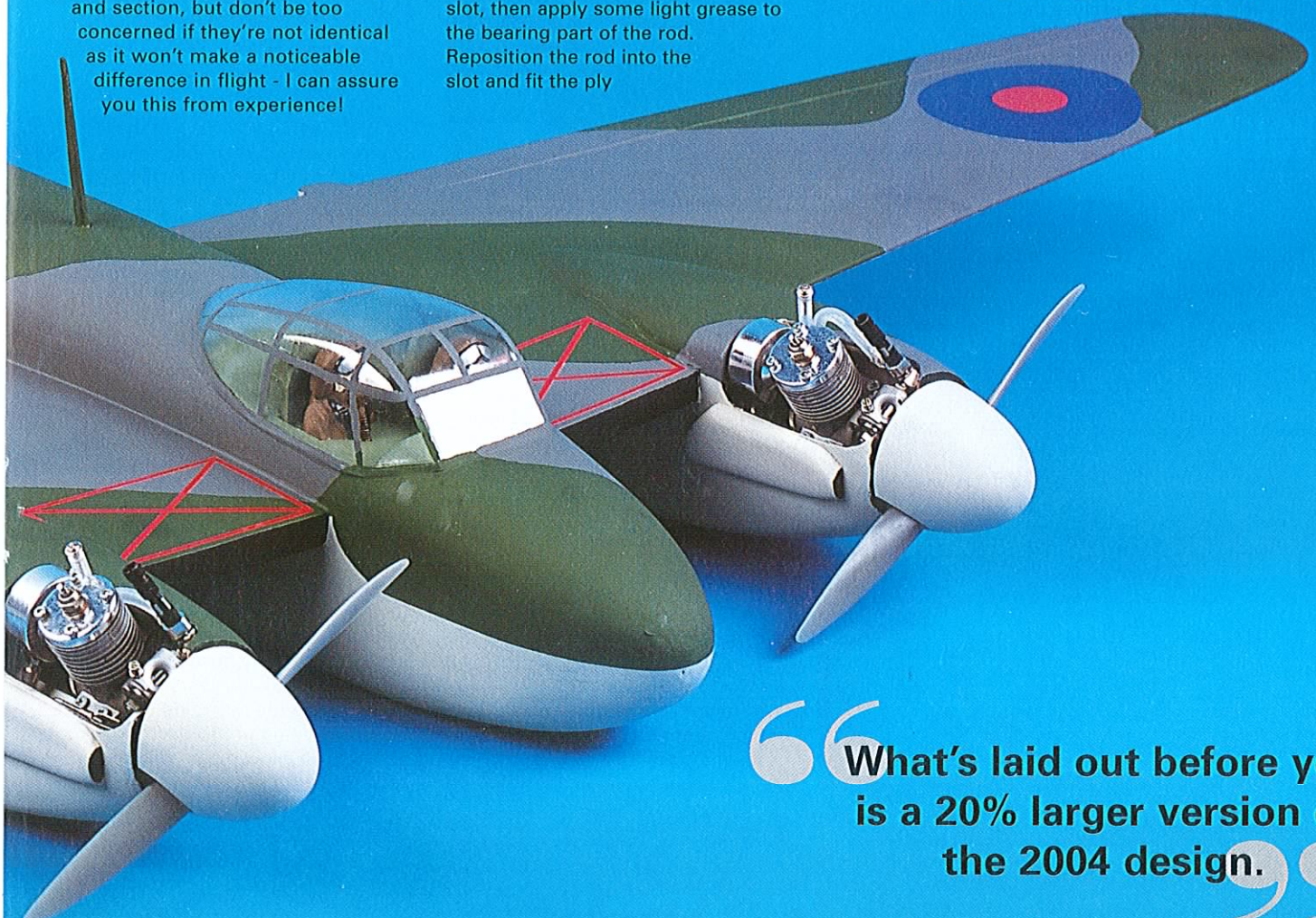
Using 9mm sheet balsa, start off by cutting out the eight main sections that go to make up the wing panels. Be sure to select the same quality of wood (medium grade) for both the left and right wing panels so the weights are similar. Glue the parts together to form both panels. What's needed now is to shape some profile into them, and the first thing to do here is to mark the area of wood to be removed in order to create the basic wing profile (detail shown on the plan). There's only one tool for this job - a sharp razor plane. Profile the panels to shape and when happy use a long sanding block (about 200mm in length is ideal) to complete them to the finished profile shown on the plan. Try to get both panels as close as possible in terms of shape and section, but don't be too concerned if they're not identical as it won't make a noticeable difference in flight - I can assure you this from experience!

When you're happy with the finish of the panels, cut out both ailerons and chamfer their leading edges. Make up the aileron torque rods using two lengths of 14swg piano wire, bending an elbow and fitting a proprietary torque rod end (alternatively you can buy ready-made commercial items from your local model shop). In order to make the bearing slot for the torque rod to sit in, use the threaded end of a spare pushrod to file a slot in the wing underside in the position shown on the plan. Make sure the torque rod is well recessed into the slot, then apply some light grease to the bearing part of the rod. Reposition the rod into the slot and fit the ply cover strip. Don't be concerned about getting glue on the torque rod as the grease will protect it.

To join the wing panels, fabricate the wing brace from 4mm birch ply and chamfer the root faces of each panel to achieve the correct dihedral. Glue the brace to one wing panel only then fit the other panel in position, check for correct dihedral and apply thin cyano' to the joints. Wing done - easy, eh?

FUSELAGE

Begin by cutting the fuselage sides from 3mm balsa and all the formers



"What's laid out before you is a 20% larger version of the 2004 design."

Tony Nijhuis

Safely away, the speed of both versions builds rapidly.

The one-piece airframe lends itself to a tissue and dope finish, though the prototypes look none the worse for their Solarfilm / Prymol / paint job.

Little brother's bigger brother... Tony's new Mosquito leans heavily on the success of his earlier offering, half of the 'Dogfight Double' published in the June 2004 issue.

Crafted from what is primarily a box section, the fuselage will evolve into a thing of curvaceous beauty!

from 3mm liteply. Using soft, 12mm triangular section balsa, line the inside edges of the fuselage sides as indicated on the plan. To aid bending the fuselage sides at the nose, make a number of saw cuts in the triangular balsa as shown on the plan. Now fit the intermediate formers 12, 13, 14 and 15 to one of the side pieces. When happy, fit the second fuselage side, pull the tail end together and glue. The remaining formers can now be fitted, followed by the 3mm liteply battery support tray.

Trim and fit the cockpit floors, apply the front and rear top deckings and enclose the fuselage by adding the lower deck. When dry, use a razor plane to roughly round the 'square' edges as indicated on the plan. The nose block can now be fitted and rough shaped. Incidentally, if you have trouble finding balsa block of the correct size you can always laminate a number of 12mm sheet pieces together to achieve the correct thickness.

Now continue to plane the fuselage edges to a smooth flowing curve... don't be frightened to cut into the 12mm triangular balsa during the edge planing, it's there to allow that smooth, flowing curve to be formed. When happy with the finish, profile and test fit the tailplane. To check the alignment

with the wing seat, put a long ruler or straight edge on the wing seat and trim the tail seat so the tailplane sits parallel.

Bend the elevator torque rod, fit through the tailplane slot and when happy, glue the tail into position. The tail block can now be fashioned and glued in place. Cut the fin and rudder and make the fin slot in the top of the fuselage, but don't glue the fin in position until the rest of the model's been covered.

MOTOR / ENGINE SELECTION

It's a good idea at this point to have the motors ready for installation. If you're going down the electric route I'd recommend using Graupner 480 7.2V motors and $6^1/_2$ x 4" APC electric props as a minimum.

If, on the other hand, you're building an i.c. version then a pair of .09s will have more than enough power to give a very scale performance and, of course, that lovely twin-engine sound. There are a number of smaller engines now on the market that have R/C carburation and are very reliable. For the prototype I used the AP (or 'Hornet') engine, which is distributed here in the UK by J. Perkins. This lovely little thing offers a combined rear exhaust and silencer, which makes it a very compact little unit and very much suited for this model. The alternatives are the new .07 from Thunder Tiger (superb!) or the .10 from O.S. or Enya.

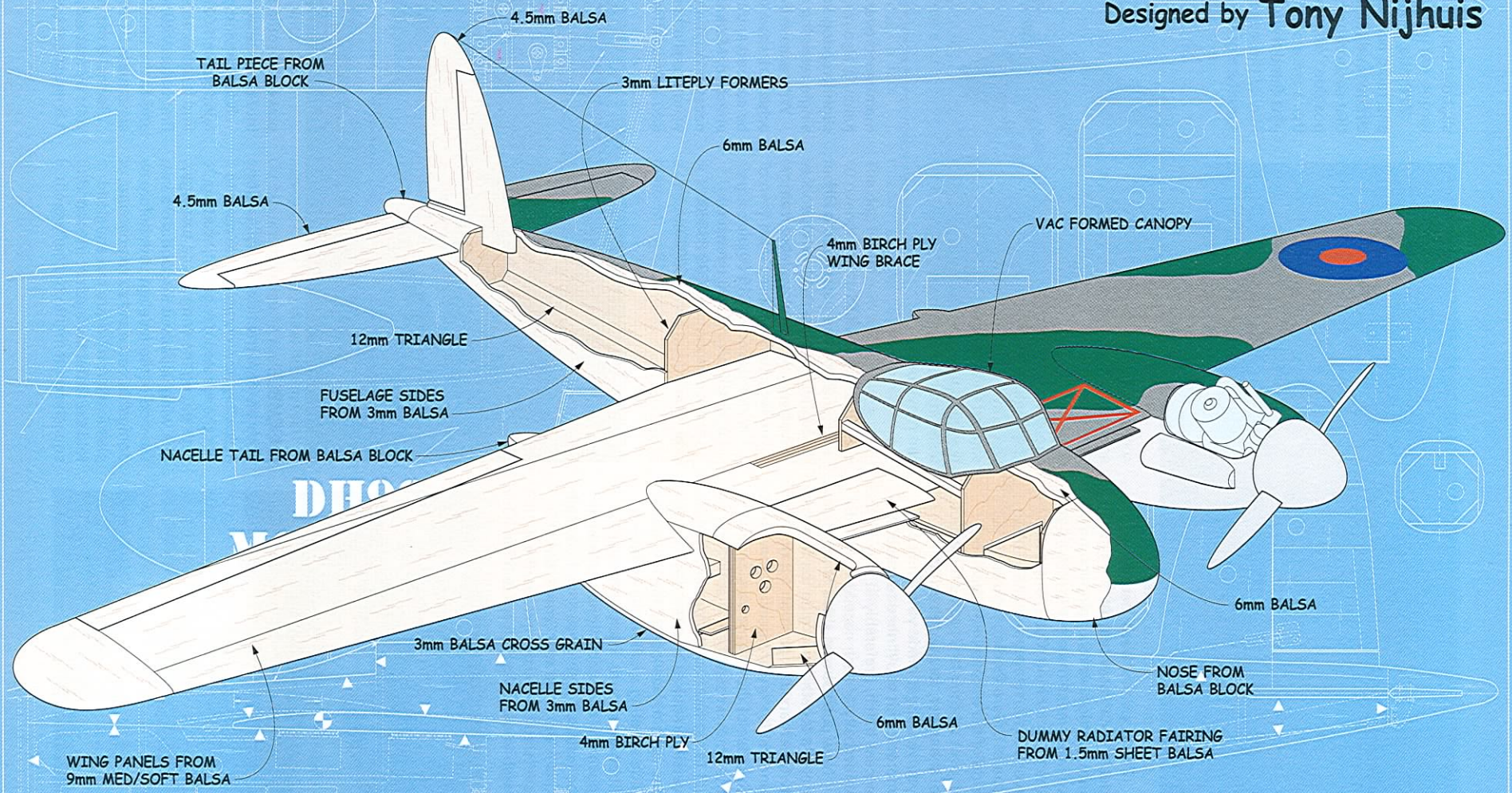
NACELLES

The nacelles are very easy and straightforward to make, the only problem is that you have to make two of them! Start by cutting out the sides, doublers and formers. For the i.c. version, make the engine bulkhead out of 4mm plywood and fit a .10-size engine mount such that the engine is seated between 45° and 90°. The reason for this is that the tank position would be too low if the engine was mounted vertically, and engine reliability problems may ensue. The electric version uses liteply for the nacelle bulkhead. Fit the doublers to create a pair of left- and right-hand sides.

Cut and insert lengths of 12mm triangular section balsa at the front top and bottom edges as shown on the plan, fit the former / engine bulkhead squarely to one side and then fit the other side. Now trim the front edges of the nacelle square and install the ply nose ring. Depending on which version you're building, cut the nose ring to either allow mounting of the electric motor or to allow the i.c. engine prop' driver to pass through.

DH98 MOSQUITO

Designed by Tony Nijhuis



Tony Nijhuis

Larger proportions offer the best of both worlds - electric or i.c. power, the choice is yours!

Whilst the i.c. version covers a lot of sky very quickly the electric job is slightly more docile on its Graupner 480s.

The upper, forward, nacelle decking can now but cut and glued into position. At this point you may wish to install the electric motors and the power wiring. Cut enough wire to reach the fuselage, and a little bit to spare. Before feeding it through the side of the nacelle in the position shown on the plan, profile the edges of the upper, forward decking. If you've not yet made your choice of motors then you'll need to make an access hatch, preferably in the underbelly of each nacelle.

Now pull the rear sides of the nacelle together and glue the final two formers into position. Fit the underside, forward decking (and in the case of the electric version, add the 3mm cross sheeting at the rear up to the last nacelle former). The i.c. version requires a little more work in the form of 'scalloping' the top and side sheeting to allow the engine to fit on the mount. The throttle servo, pushrod, tank and plumbing should be installed at this point, and once all this is done the rear 3mm cross sheeting can be completed. If you wish you can fashion a hatch for access to the throttle servo but, to be honest, as long as the set-up is correct, it really shouldn't be necessary. The completed nacelle can now be planed and sanded to a smooth, flowing curve. Complete a second nacelle and we can move on!

Decisions, decisions... electric or i.c? Graupner 480 power is the bare minimum for electric flight; a pair of AP .09s proved ideal bedfellows in the i.c.-powered prototype.

MOULDED PARTS

Vacuum formed parts for the DH Mosquito, comprising canopy and spinners, are available from the Highbury Leisure Plans Service priced at £10.00 plus £2.15 UK p&p (£3.50 overseas). Please telephone 01689 886660 and quote ref. CANRC2025).

slightly; doing this will allow the torque rod arms to slide through.

With the wing attached the battery and radio access hatch can now be cut out and removed, and the lugs that secure the hatch glued into position. You'll note on the plan that there are a couple of hatch rocker pins fitted through the fuselage. The idea of these is to ensure that the curvature of the fuselage is maintained over the length of the hatch. It also means the hatch is slightly spring loaded, so only a single retaining screw is needed.

With access into the fuselage now achieved, the aileron torque rods can be centred and the plastic ends re-attached. Mark the position of the nacelles on the underside of each wing panel and glue them squarely into position. Feed the end of the power / throttle servo wiring through into the fuselage.

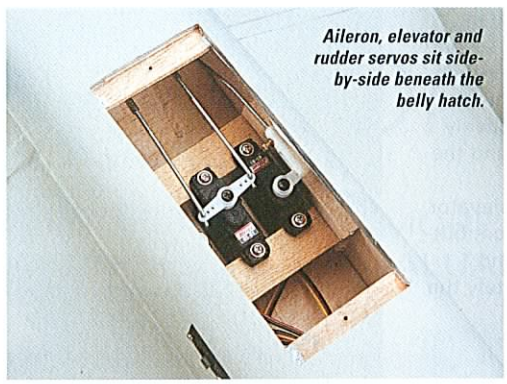
ENSEMBLE

With the construction of each major assembly now complete we need to put the whole lot together, starting with gluing the wing to the fuselage. The wing is passed through slots in the side of the fuselage, but before doing this you need to remove the plastic aileron torque rod ends and fold the arms flat against the wood, squashing them into the surface

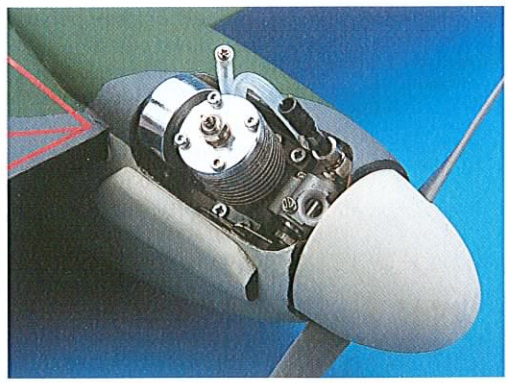
Now cut and glue the wing nacelle fairings (part 32) into position. You'll find it easier to shape these parts first before fitting to the wing. Cut and fit the nacelle tail blocks and sand them to a final finish.

To make the wing radiator fairings, start by feathering in a piece of 1.5mm sheet balsa between the

nacelle and the fuselage as shown on the plan. A second piece of sheet balsa is then fitted parallel to the underside of the wing. If desired you can infill between the two sheets using 3mm balsa. These fairings are only for aesthetics, but they do hide the power / servo wiring from the nacelle to the fuselage. When happy, apply lightweight filler where required and give the whole model a final sanding, to finish.



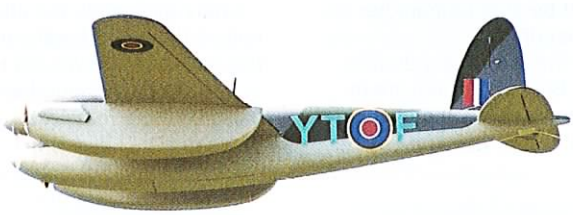
Aileron, elevator and rudder servos sit side-by-side beneath the belly hatch.



Depending on the version built, the nose ring will either mount the electric motor or simply clear the i.c. prop' driver.

COVERING & FINISHING

Cockpit detail can now be added. Fortunately the size of model lends itself nicely to a J. Perkins small plastic jet pilot, which, though needing to be reduced in height a little, is of perfect scale and really sets the model off a treat.



There's fun to be had, with most aerobatic manoeuvres at your disposal.

A one-piece airframe such as this isn't easy to film cover and so lends itself to be finished in tissue and dope. That said, I elected to use silver Solarfilm for the prototypes (simply because that's all I had at the time), and as both models required painting anyway, the Solarfilm job didn't have to be perfect. Although there are some tight corners, a small covering iron gets to most of them easily. To paint over film covering you must first give the model a coat of Prymol (Solarfilm etching primer). The base colours can then be brush applied using either matt enamels or acrylic paint. Oh, and don't forget to add the fin and rudder!

R/C INSTALLATION & SETUP

Glue the servo support bearers into position and fit the rudder, elevator and aileron servos side-by-side, the aileron servo being in the middle. Fit the control horns to the rudder and elevator and make up the connecting pushrods using 16swg piano wire. For the aileron pushrod I used 2mm threaded end rod, cut to length with a 'Z' bend applied.

For the electric version, the speed controller will need to be passed through the small hole in the battery compartment floor. Depending on the size of controller, you may need to open up the hole slightly to access this. Use self-adhesive Velcro to secure the batteries, Rx and speed controller. For the i.c. version, fit a standard Rx battery as far into the nose as possible.

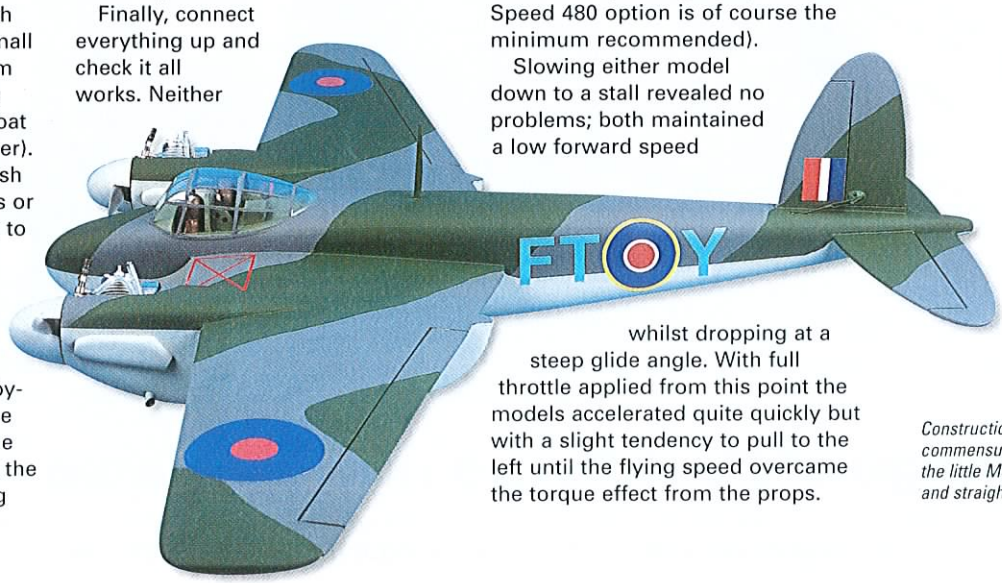
Finally, connect everything up and check it all works. Neither prototype required any additional ballast to achieve the C of G; strangely, when both models were weighed, the i.c. version came out 2oz heavier than the (batteries included) electric version! All the control movements, C of G and trim settings were taken from my smaller Mossi, and as a result both prototypes flew straight and true with only minor trim adjustments.

FLYING

With any twin-engine model there's the ever-present possibility of torque rolling on hand-launch, but with a slightly larger aeroplane such as this the problem is far less noticeable. Notwithstanding, it's worth getting someone to hand-launch the model for you until you get used to the launch characteristics.

Away and climbing, the speed of both prototypes built up quickly. The i.c. version has ample power and covers the sky very smartly - agility is good, and most aerobatic manoeuvres are possible. The electric Speed 480 version, although being slightly lighter, didn't have the sparkle and speed of the i.c. version, as you might expect (the Speed 480 option is of course the minimum recommended).

Slowing either model down to a stall revealed no problems; both maintained a low forward speed whilst dropping at a steep glide angle. With full throttle applied from this point the models accelerated quite quickly but with a slight tendency to pull to the left until the flying speed overcame the torque effect from the props.



Construction is commensurate with the little Mossi - quick and straightforward.

FREE PRO-PLAN

Tony Nijhuis

Whatever your choice of motive force, the Nijhuis Mosquito will deliver the goods in fine style.

So how do they behave when flying on one engine? On its second flight the left-hand i.c. engine gave out whilst pulling a tight right-hand turn. As the model was effectively knife-edging, the nose rose and the model flicked into a flat spin. Opposite rudder and down elevator helped to recover the situation, but not quick enough... the ground loomed ever closer! Fortunately the model stopped falling and began flying again just as it hit the ground. To my relief there was absolutely no damage sustained. So the moral here is if you do have an engine out, throttle back and use the rudder to flatten out the turns and you should be able to coax her in for a safe landing.

Landing the model is a doddle (assuming both propellers are in unison!) The Mossi will glide happily with or without power and can be slowed down without the risk of tip stalling. Even when slowed to the point where elevator authority reduces so full up is applied, the model will just 'mush' and put its nose down, continuing the glide (if a little steeper).

I may be biased, but all in all I reckon this model really does tick all the boxes... so now's the time for all you avid builders out there to get balsa bashing for some summer flying fun!

DATAFILE

Name:	De Havilland Mosquito
Model type:	Semi-scale twin engine fighter / bomber
Designer:	Tony Nijhuis
Wingspan:	47" (1175mm)
Length:	35" (875mm)
Weight:	40oz (0.55kg)
Wing loading:	22oz / sq. ft. (2.04kg / sq. m)
Motors (electric):	2 x Speed 480 7.2V (minimum) on 8 x 1700CP cells
Engines (i.c.):	2 x .07 to .10 two-stroke
Radio:	4-function micro
Vac' mouldings:	See panel on page 66