

Spitfire Mk.IX



BACK TO THE DRAWING BOARD FOR TONY NIJHUIS, RELENTLESS IN HIS PURSUIT TO BRING TRADITIONAL BUILDING TO THE MODELING MASSES

You can never have too much of a good thing, you know. If you made my smaller Spit' then perhaps it's time to do another?

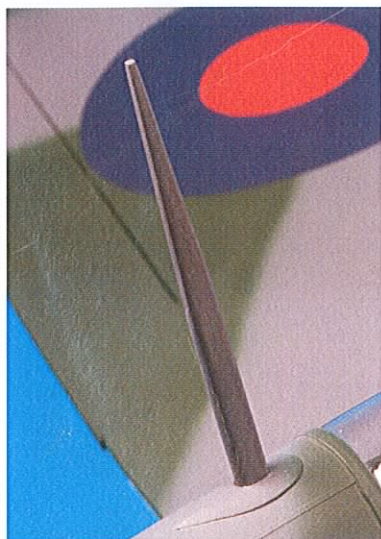
Those of you who bought the RCM&E Special issue back in October 2006 might be feeling a sense of déjà vu right now - and rightly so, as what you see before you is a scaled-up version of the very successful 45" span Spitfire that I designed exclusively for the Special (copies of which are still available from Magalia, should you have missed out).

Some modellers will no doubt be questioning why I've gone to the

trouble of designing a larger version. The answer lies in the old adage 'you can't please all of the people all of the time'. A truer statement has never been made, however it is possible to listen and sometimes develop something that will appeal to a wider audience, and such is the case here. The 45" Spitfire filled a niche and satisfied modellers who wanted a small fun-fighter size warbird. The idea was that this one could sit in the boot of a car fully

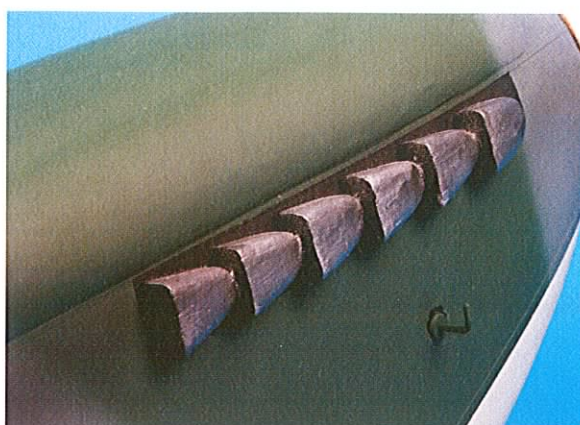
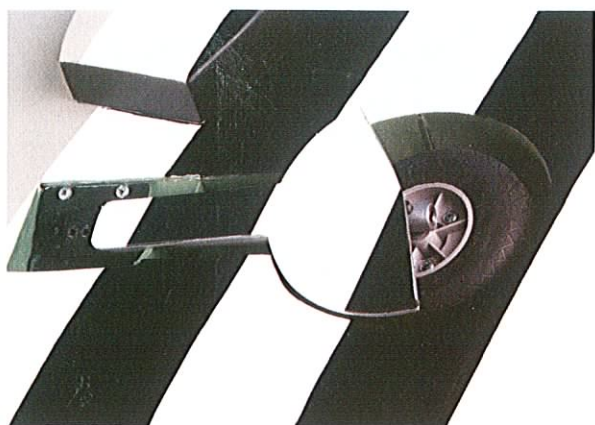
rigged and be ready for a flying opportunity at the drop of a hat. By all accounts it filled the brief perfectly, and indeed the plan is still selling in large numbers. That's all very well, but if you were to poll a group of modellers as to the ideal size for a model Spitfire, invariably they would suggest a 60" span version with a .60 engine. I can fully understand this; larger models are easier to fly than smaller ones, they cope better in windy conditions and

For obvious reasons this antenna is removable. Don't skip it though, it really is very noticeable.



As you can see, I went the whole hog and made a static display prop. Looks grand doesn't it?





A high torque 6kg servo provides the necessary grunt for retract operation.

Every little detail helps to make the model what it is, and in this respect the exhaust stubs must be considered essential. They're not difficult to make though!

they aren't as twitchy. So all in all, bigger tends to be better. The other 'plus' with a larger Spit' is that retractable undercarriage is feasible. This not only makes it more authentic but also avoids the hand-launch requirement of its smaller brother, which can be a bit traumatic for some!

TALL ORDER

Fitting a fixed u/c to a Spitfire, such that it has good ground handling characteristics, can be problematic. And fitting retracts doesn't make life any easier, I can assure you! At $62\frac{1}{2}$ " (1588mm) wingspan the scale wheel size is around $3\frac{1}{4}$ "; a sport tail-dragger is fine with this on most grass flying strips, but put these wheels on a Spitfire in the scale position and the model would no doubt tip on its nose with only the slightest provocation. This being the case I employed a little 'design licence' to overcome the problem. Keeping the $3\frac{1}{4}$ " scale wheels I cranked the legs forward slightly, making sure the wheels were a good couple of inches forward of the C of G. This means that the model will only tip onto its nose at a point well after prop ground clearance is lost.

Theory is all well and good, but the acid test is of course the practical result. Thankfully, the flexing of my designer's licence paid off. On a warm spring morning with grass covering all but the very tops of the wheels, I was amazed to see the Spitfire happily ploughing through the turf, showing no desire to nose-over, and being easily balanced with elevator.

SIZING UP

So, that's the u/c sorted out, but what about the rest of the design? Well, I could puff out my chest and say the

model was a complete redesign, but that would be telling porkies. I have a very simple philosophy when scaling up a smaller design; select a scale where the wood sizes also jump a size. For example $\frac{1}{16}$ " becomes $\frac{3}{32}$ ", $\frac{3}{16}$ " becomes $\frac{1}{4}$ ", and so on. Spar and longerons slots remain unchanged, which means the original (smaller) plan remains reasonably intact. It also means that the CAD-based CNC files for manufacturing need only minor alteration. So, when working out the sizes, $62\frac{1}{2}$ " came out as the optimum wingspan. Having said all that, the introduction of retracts did alter the wing spar positioning, but nothing too drastic.

Right. On with the build. As with most of my plans, a CNC-cut wood pack is available through via RCM&E, so order yourself one and let's crack on.

WINGS

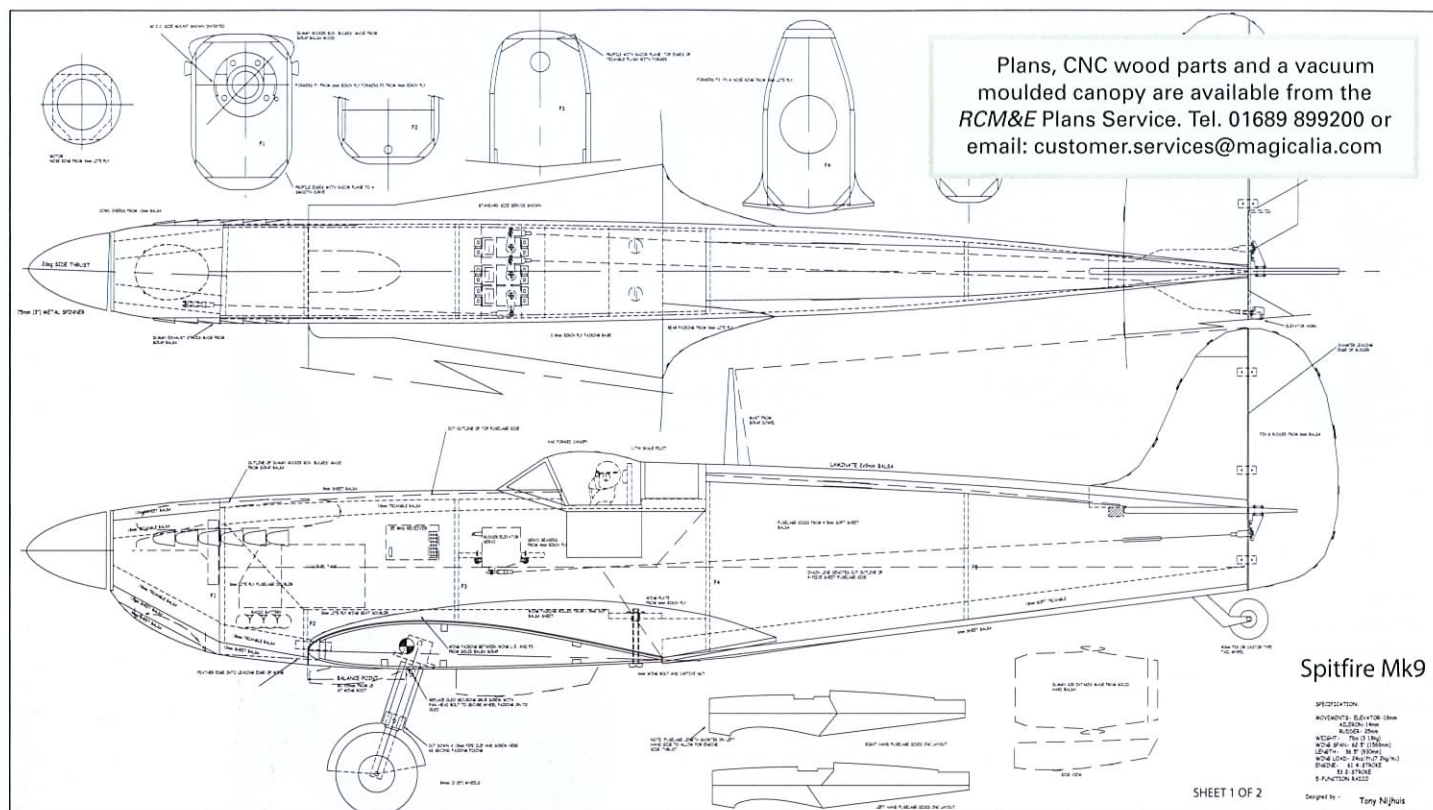
The wings are of traditional construction, built over the plan. Begin by cutting and pinning the



The position and design of the retract mounts on the plan are specific to the mechanical 'sport' retracts supplied by Unitracts International. Should you use other units, then, of course, you'll need to amend the mounting.

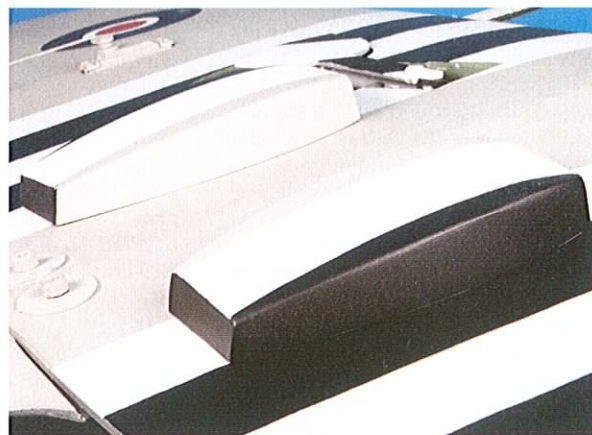
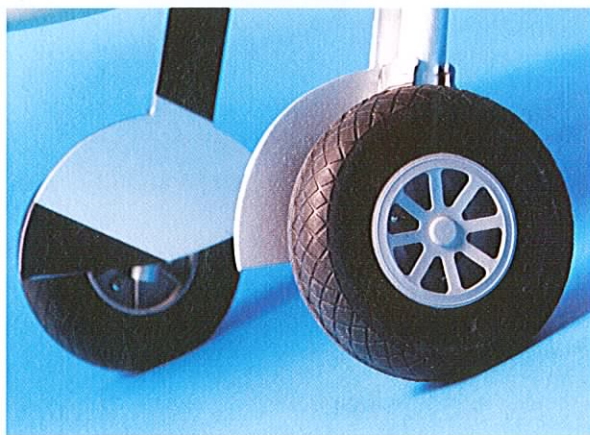


Whilst the wing has no washout by design, you can improve the low-speed handling by adding up to $\frac{1}{2}$ " if desired.



Spitfire u/c installations need a bit of care in order that the lady doesn't disgrace herself by nosing over. I wafted my designer's licence at this one, cranking the mains forward to avoid the prototype doing just that. Works well, too.

The underslung air intakes are another detail that really shouldn't be ignored.



main spar for one wing panel to the plan, and then notch the spar to accept tip rib W11. Now fit the rest of the wing ribs, remembering to angle W1 to take account of the wing dihedral. Fit the top spars, followed by the inner l.e., and the t.e. where the aileron sits. When dry, sand the l.e. top section, spars and trailing edges flush with the ribs and sheet the top of the wing with $\frac{3}{32}$ " medium / light balsa. Remove the wing panel from the building board, fit the remaining spars to the underside and trim any overhanging sheet back to the exact profile outline. Now advance the other wing panel to the same level of construction.

The aileron servo mount bearers should now be recessed into wing ribs W6 and W7. At this point either install the aileron extension lead or install a 'draw' string for this to be done later. Now apply the shear webbing between the main spars as shown on the plan.

Add the retract mounts and the retract servo mount, cutting away the top sheeting to allow access to the retract servo. I used a conventional high-torque 6kg servo on the prototype, fitted inverted onto the mount. To make the retract installation easier, temporarily fit the mechanism and its servo, then firmly clamp the wings together. The retract

mounts shown on the plan are in the position, and of a size, to accept the mechanical sport retract supplied by Unitracts International. A custom sport oleo is also available to suit this Spitfire, both items being available as a package on request.

Now make up the retract pushrods. On the prototype a large round servo turret was used, and ball links fitted to the position shown on the plan to make the geometry work. When happy with the installation, the retracts, servo and pushrods can be removed.

Now sand the l.e. bottom, spars and trailing edges flush with the ribs and sheet the underside of the wing



There's enough room in the cockpit for an element of detail and, of course, a fighter pilot!



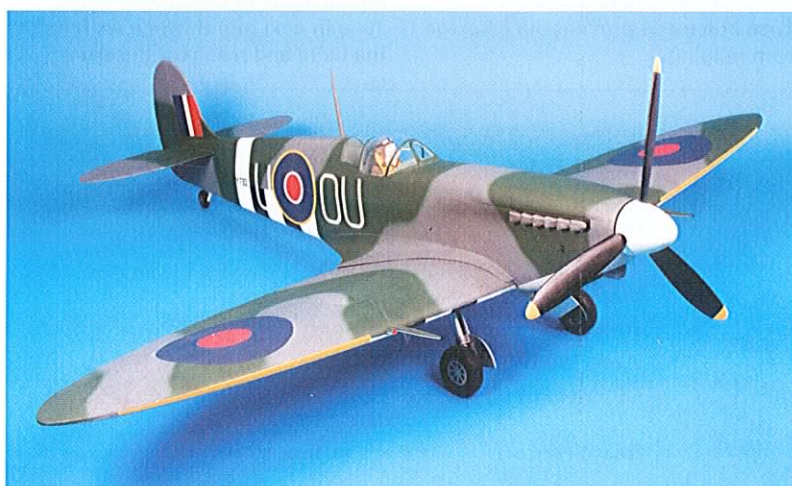
Undersize tail wheels just don't cut the mustard on scale models. Do make sure yours is correct.

with $\frac{3}{32}$ " medium balsa. The prototype had no washout built into the wings, and during testing the model remained docile and predictable in the stall. However, if you wish to build in $\frac{1}{2}$ " of washout, this will no doubt improve the low speed handling. It's up to you.

Trim the top and bottom wing skins flush with the edges, then fit the outer leading edge and shape this to the profile that's shown on the plan. Now cut out the wingtips from block balsa (or sandwiched balsa sheet) and glue them to W11. Roughly shape the tips and then finally sand to a smooth, flowing profile to match the wing.

Start the ailerons by cutting the bottom skin to shape, then trimming and fitting the leading edge at the angle shown. The ribs can then be fitted and the assembly closed with the addition of the top skin. Trim to shape and the job's done.

My philosophy for 'scaling up' is pretty straightforward, based on taking the design to the next wood thickness (see text).





Just to whet the appetite for next month's instalment, here's the Spit' in her element. If that's not enough to get you building, nothing will!

ORDER LIST

Item	Code	Price
Plan	RC2041	£14.95 plus p&p
Canopy moulding	CANRC2041	£7.45 plus p&p
CNC wood selection	CNCR2041	£70.00 plus p&p
Spitfire plan pack (inc. all of the above)	SETRC2041	£89.00 plus p&p

For a retract set contact Unitracts International. Tel. 01474 359990

Standard servos will do the trick, although I did use a unit with a slightly higher torque for the elevator.

The wing panels can now be joined using epoxy. When dry, strengthen the joint with a 3" wide glass fibre bandage wrapped around and bonded with epoxy.

FUSELAGE

Each fuselage side is made from four pieces, as depicted on the plan. Note that the pieces of each fuselage side are different; the left-hand fuselage side (looking towards the front) is shorter, to take account engine side-thrust.

Glue the parts together to make left- and right-hand sides, and when dry, apply 0.7" (18mm) triangular section to the edges as indicated on the plan. Now glue the wing seat

doubler and forward doubler into position, making sure the thickness of fuselage formers F1 and F2 are taken into account. Add formers F1, F2 and F3 (note that the curved upper sides of F3 should not be glued yet). Now chamfer the 0.7" triangular section at the tail to enable the fuselage sides to come together. Fit the remaining formers F4 and F5, pulling and gluing the tail together and checking alignment as you proceed. Cut a piece of 12mm x 17mm balsa and trim to a suitable length ready to be inserted between the fuselage sides (just in front of the tailplane) where it will act as a cross brace and prevent the fuselage from bulging.



TIME OUT

The bell's sounded, so it's time for me to enjoy a cuppa and a lie down before flexing my fingers on the laptop again to conclude the tale. Tune in next month when we'll finish the build and reach for the skies!



DATAFILE

Name:	Spitfire Mk.IX
Model type:	Scale warbird
Designed by:	Tony Nijhuis
Wingspan:	62 1/2" (1588mm)
Fuselage length:	53" (1350mm)
Wing area:	4.7sq. ft.
All-up weight:	7 lb (3.18kg)
Wing loading:	24oz / sq. ft.
Control functions:	Aileron, elevator, rudder, throttle, undercarriage
Rec'd motor:	.61cu. in. four-stroke

Spitfire Mk.IX



TONY NIJHUIS CONCLUDES THE BUILD OF HIS TIMELESS WARBIRO

Wheels up and away. Take-offs are straightforward, just remember to keep the tail down early on.

My pilot is a 1/7 scale chap from the J. Perkins range - fits the cockpit beautifully.

I'm always saying it but the small details make all the difference. Don't skimp on yours.

Last month I left you in the lurch somewhat, nursing a partly built fuselage. Well, it's time to get busy again and fear not, this time there'll be no cliffhanging finish. Instead, we'll see the build through to conclusion and then get her airborne.

Okay, retrieve your partially built fuselage, curve the top of the sides and glue them to the upper edges of F3, F4 and F5 (you may need to wet the outside fuselage surfaces to aid bending). You'll notice that the fuselage top edges at F1 and F3 overhang the formers slightly, so use a razor plane to bring the sides down flush with the tops of the formers. When you're happy with this add the

upper front and rear decking, using soft 9mm balsa sheet. Now fit the forward lower decking using hard 12mm balsa sheet and trim any overhang flush with F1. Mark the location of the engine mount, drill the mounting holes into F1, bolt the engine mount into position and secure the engine (without silencer fitted). The cowl sides can now be cut out, trimmed and fitted. Adjust the front edges so the ply nose ring sits square to the engine, using a 75mm spinner backing plate to centralise the nose ring before marking its position with a pen. Remove the engine and fit four lengths of 18mm triangular section balsa flush with the inside top and bottom edges of the cowl cheeks.

Cut out and fit the top and bottom cowl pieces and trim the nose so the ply nose ring sits flush. When happy, glue the nose ring to the previously marked position.

The rear lower fuselage decking can now be cut and glued into place, using the wings to position this correctly. With this complete, shape the fuselage using a razor plane and sandpaper. Take your time over this and don't be concerned about trimming deep into the 18mm triangular section, because that's what it's there for.

WING & TAIL FITTING

The wing's captive nut mounting bracket can now be installed in the fuselage, along with the retaining dowel in the leading edge. Before test-fitting the wing, cut out the fairing base pieces from 0.8mm birch ply and 3mm liteply as detailed on the plan. Fit the wing and slide the 0.8mm pieces into position, sandwiched between the fuselage and the top surface of the wing. When you're happy with the location, glue them in place, but only along the fuselage edge. Wait for the glue to dry before removing the wing, after which the fairing base should permanently adopt the correct airfoil camber. Trim and glue the rear 3mm liteply piece against both the fuselage and the trailing edge of the 0.8mm fairing. Using soft 1.5mm balsa, cut the upper fairing pieces to the profile shown on the plan's fuselage side view. Note that this part is rolled in one piece and glued against the fuselage before the fairing base pieces. The forward





As you can see, the impression in the air is just right.

section of the fairing (from F3) is made from solid balsa, shaped to blend in with the rolled fairing deck.

To add a little scale detail, the dummy engine 'rocker box' bulges should now be applied. These are made from very soft 6mm balsa sheet cut to shape, wetted and applied to the position shown. Using a knife, sandpaper and lightweight filler, blend the 'bulges' into the fuselage. Another essential detail, the under-wing radiator scoops, are constructed from laminated sheet balsa. To make life easier, it might be best to fit these after covering.

Just the tail feathers to fit now and the airframe should be practically complete. Okay then, cut the tailplane and fin to the profiles shown on the plan, then position and glue the tailplane in place. Make the slot for the fin and glue that, too (you may wish to cover the fin before fitting).

COVER STORY

It's up to you when you fit the canopy, but cockpit detailing and fitting is best



A 3" aluminium spinner (painted, of course) will do nicely at the sharp end.

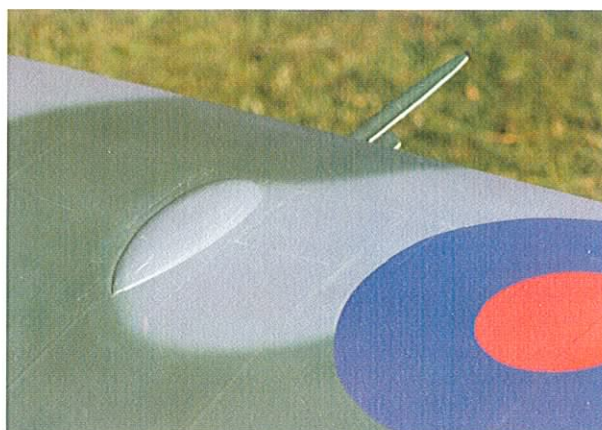
carried out before covering. The Spitfire is approximately 1/7th scale so there are a number of W.W.II pilot figures available - I used the unpainted latex rubber type available from J. Perkins stockists.

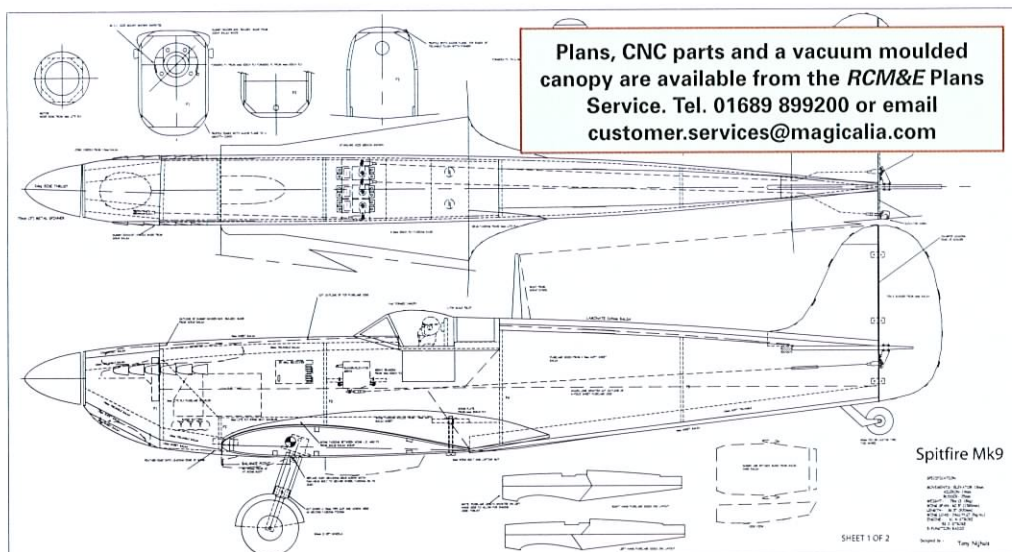
Bend and fit the elevator torque rod and attach the control surfaces with Mylar hinges, secured with glue and pins. Fit the servos and elevator control horn and finish making the

other control rods. Now check the control movement with the radio hooked up and the receiver in situ.

With the radio installation complete the model can be covered and painted. The prototype you see here was covered in silver Solarfilm then treated to a coat of Prymol (Solarfilm etching primer) prior to painting with J. Perkins enamels, or something similar. The main colours

I used Snake Tape from MFA to represent the panel lines. Although the canon blister is balsa, I've used plastic spoons in the past!





As an everyday scale model that's designed to be flown regularly, this one's just the right size.

She's safe, predictable and goes exactly where you put her.

are Sea Grey and Dark Green for the top camouflage and Light Grey for the under surface.

As an alternative, the airframe could be covered with Solartex, or for a really strong finish, glass cloth and epoxy will provide a very durable platform.

Roundels can be either marked and then hand painted or added with

coloured Solartrim. You may be able to find suitable decals in the local model shop but if you really get stuck try www.pyramidmodels.com. Pyramid will almost certainly have something to suit. For my part, I painted the squadron markings whilst the invasion stripes were made using black and white Solartrim. Finally, in terms of



detailing, don't forget the exhaust stacks, the aerial and the undercarriage leg covers - all are essential to the overall impression that the model portrays.

I can almost guarantee that ballast in the form of lead will be required in the nose area to achieve the correct C of G position; some 4 - 6oz should do the trick.

FLYING

Now there's an old saying that says 'if it looks right it'll fly right', and with a Spitfire you can pretty well guarantee it's going to be good, but just how good? Well, as this model is based on the smaller 45" Spitfire plan, all the important parameters such as the C of G and the control throws were pretty well known, so test flying the model for the first time didn't fill me with the trepidation it otherwise might. The only unknown was how the model would perform



To improve the ground handling the undercarriage has been cranked forward slightly, although to the untrained eye the effect is barely noticeable.



on the ground and whether the subtle modifications to the undercarriage leg angle might make a difference. As I mentioned last month, however, even with long-ish grass she coped very well. She will tip onto her nose from a standing start unless the grass is very short but once rolling and with up elevator applied she'll taxi nicely.

Opening the throttle gently should see the Spitfire gather speed and as ground-speed increases so up-elevator can be backed-off to a point where she balances perfectly on the main wheels. From here she'll gently rise off the ground and should climb away with the power and grace you'd expect from a Spit'. A warbird comes to life when the wheels are up and so it is with this one. Even on the maiden flight I found that by the time I'd completed the first turn everything felt right about this model. Two clicks of down trim with no change required to the aileron or rudder had her flying hands free. Being that little bit bigger, the twitches you may have noticed with the smaller version disappear, in fact, I hope you don't mind me saying but this Spit' feels pretty darn perfect. The model instils great confidence and the feeling that it'll take almost anything you throw at it.

As for the engine? Well, the .61 four-stroke seems to be the ideal powerplant, with ample urge available, room enough to hide most of the inverted engine in the cowl and space in the fuselage to house a large fuel tank for good duration.

Landing is easy, too, the Spitfire feeling very smooth and predicable right down to the ground. Keep her rolling as soon as the wheels touch and feed in a little up elevator to ensure that the tail stays down.



I'm grateful to reader Steve Emery who wrote in a few months ago about UOU. She was built in 1944 and flown by RNZAF pilot HWB Patterson who nicknamed the aircraft 'Baby Bea V' after his fiancée Beatrice.



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I don't know about you but I never tire of that classic shape.

It may look a complicated model but the Mk.IX is designed to be built quickly. In this respect, sheet tail surfaces and a simple fun-fighter fuselage construction assist no end.



THERE YOU HAVE IT...

I really don't think you'll be disappointed with the performance of this Spitfire, it goes where you point it and does what you ask of it. Just remember that this is a scale model so producing a scale flying performance is the order of the day. She'll perform most manoeuvres expected by a Spitfire - barrel rolls and loops are a delight, but it excels at a low fast pass followed by a climb into a half roll and reversal. Satisfying to build and a delight to fly, you'll love it.

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