

## REACH FOR THE SKY WITH THE MOST FAMOUS WARBIRO OF THEM ALL. CAN YOU REALLY RESIST OUR LATEST TONY NIJHUIS DESIGN?

**S**o you've completed your initial flight training, mastered your low-winger and are totally confident in your ability. These skills open new doors in terms of the models available to you, models that demand experienced hands. So what to choose? There's a huge selection available, from plans through traditional kits to ARTFs, i.e. powered or electric, but there's one design that's a perennial favourite... the Supermarine Spitfire. The classic lines of R.J. Mitchell's fighter never cease to attract. Seeing those elliptical wings carve through the sky is so evocative of the Battle of Britain, where the Spitfire and Hurricane took centre stage in thwarting the Luftwaffe's attempt at destroying the RAF as a prelude to invasion.

Whilst I've designed quite a few models I've only one Spitfire plan to my credit, which was one half of the 'Dogfight Double' free plan featured in the August 2002 issue of *RCM&E*. At 30" wingspan and designed for Speed 400 electric power it was certainly fast and great fun, but since then I've wanted to make a slightly larger version to



accommodate a .15 - .25 two-stroke engine - something like the old Cambrian Fun Fighters that were so very popular during the '80s and early '90s.

So, a bit of doodling conceived what's presented to you here, a 46" (1168mm) version of the Mk.9 Spit' that can be powered either by a two-stroke i.c. engine or electric. In this latter respect, the FlightPower Evolution Synergy 'hot park' package is an ideal off-the-shelf solution for a fuss-free electric conversion.

When designing this Spit' the first thing I had to consider was how to make that elliptical wing - not something I relished. In the past I've tended to take the easy route and use 9 or 12mm sheet balsa, literally razor-planing the wing to shape.



However, with this size of model, sheet wings are at the limit of their appeal and practicality, so I decided to go for a 'traditional' structure of ribs and spars, built over the plan. Designing a set of ribs for an elliptical wing seemed a daunting task at first, but having recently bought a copy of the Compufoil 3D CAD package with elliptical wing design software it wasn't too long before a set of fully lofted wing ribs and a wing plan was ready to be imported into my AutoCad drawing of the Spitfire. Ah, the joys of modern technology! There's no washout built into the wing, mainly because the benefits are so marginal. Building the model as light as possible will assist far more in this respect.

At 46" span the model is small and light enough to be hand-launched or, if you prefer, coupled to a dolly. It may be possible (and I'm sure some builders will try) to install retractable undercarriage, but you'll need very short grass or a



*Tony's Spitfire has been designed to be both good looking and a practical flyer. Sure enough, it ticks both boxes!*

## WING

The first assembly to be constructed is that lovely elliptical wing, making one panel at a time. Cut and pin the lower

sections flush with the ribs and sheet the top of the wing with 1.5mm medium / light sheet balsa. When you've done this remove the wing panel from the building



*Have you a better place for that spare .25cu. in. two-stroke? We think not! Go on, put it in something special.*



*The choice of colour schemes is vast, though you have to admit those invasion stripes really do set her off a treat.*

tarmac runway to avoid the nose tipping over - it really would look superb with a scale undercarriage, though!

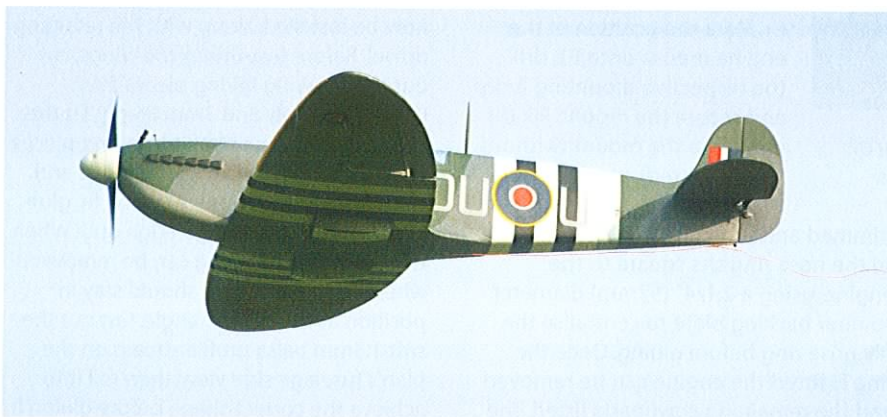
Okay, to the building board. As with most of my plans a CNC wood pack containing wing ribs, formers, tailplane and fuselage sides is available from RCM&E and will speed the build significantly.

front and rear wing spars to the plan and notch the spar at the tip to accept the tip rib W11. Fit all the wing ribs, remembering to angle W1 to take account of the dihedral, then trim and fit the top spars. Add the inner leading edge (l.e.) and the training edge (t.e.) where the aileron sits. Now sand the top l.e., spars and t.e.

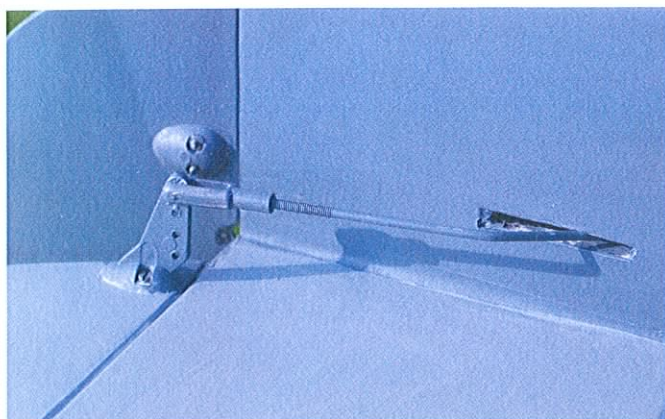
board and trim any overhanging sheet back to the exact profile outline. Construct the other wing panel to the same level.

With both wing panels now to hand, recess the aileron servo mounting bearers into wing ribs W6 and W7 and either install the aileron extension lead or install a 'draw' string for this to be done later. Now apply the shear webbing between the forward top and bottom main spars as shown on the plan. Sand the bottom l.e., spars and t.e. sections flush with the ribs and sheet the wing underside using 1.5mm medium balsa.

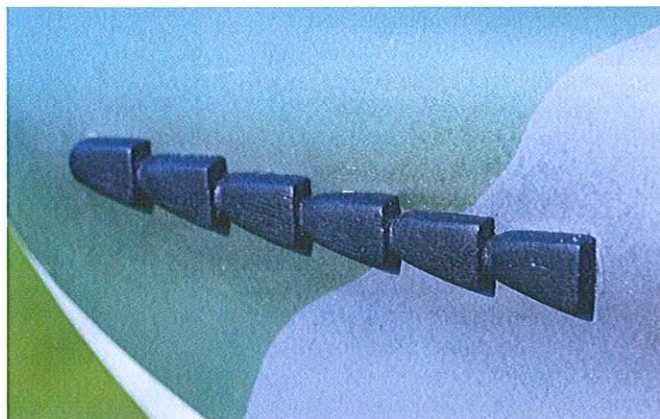
Trim the top and bottom wing skins flush with the edges, then fit the outer l.e. and shape this to the profile shown on the plan. Cut out the wing tips from 12mm sheet balsa and glue them to W11. Roughly shape the tips before sanding to a smooth, flowing profile that matches the wing.







*Spray those horns and they'll blend in beautifully.*



*Balsa exhaust stubs are perfectly adequate for this model.*

Construct the ailerons as per the plan by first cutting the bottom skin to shape, trimming and fitting the i.e. at the angle shown. Fit the aileron ribs followed by the top skin, then trim to shape. The wing panels can now be joined and a strengthening bandage applied.

## FUSELAGE

Each fuselage side consists of upper and lower halves. Glue the halves together to make left- and right-hand panels. Apply 12mm triangular and 6mm square section balsa to the edges as indicated on the plan, then glue the wing seat doubler and the forward doubler into position, making sure the thickness of the fuselage formers F1, F2 and F3 is taken into account. Now glue into position formers F1, F2 and F3 (note that the curved upper sides of F2 and F3 aren't glued at this stage).

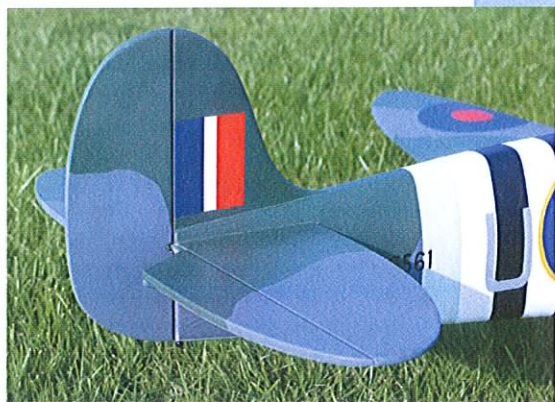
edges of F2, 3 and 4 - you may need to wet the outside surface of the fuselage to aid bending. You'll notice that the upper edges of the fuselage overhang the formers slightly, so use a razor plane to bring the

forward and rear lower fuselage sections can now be added and trimmed so the wing sits snugly.

Right then, time to shape the fuselage using a razor plane and sandpaper. Take



*Purring past, she's easy to fly if you've a few models under your belt.*



*This Spit' was covered in Solarfilm, given a coat of Prymol, then painted with Humbrol enamels.*

Chamfer the 6mm square balsa at the tail so the fuselage sides come together at the rear and then fit the remaining formers, pulling and gluing the tail together and checking alignment as you proceed. When the glue's dry, curve the top fuselage sides and glue them to the upper

fuselage sides down flush with the tops of the formers. With this done apply the upper front and rear deckings, followed by the front lower decking, and trim any overhang flush with F1. Mark the position of the engine mount onto F1, drill the respective mounting holes and secure the mount. Fix the engine to the mount (without silencer fitted), at which point the cowl sides can be cut out, trimmed and fitted. Trim the front edges so the nose ring sits square to the engine, using a 2.1/4" (57mm) diameter spinner backing plate to centralise the ply nose ring before gluing. Once the ring is fitted the engine can be removed and the remaining cowl parts fitted. The

your time over this and don't be concerned about trimming well into the 12mm triangular at the edges, as that's what it's there for. Glue the cockpit floor into position and cut the openings for the fin. The wing 'T' nut mounting bracket can now be installed, along with the retaining dowel. Before test-fitting the wings, cut out the ply wing fairing pieces from 0.8mm birch ply and 3mm liteply. Fit the wing and slide the birch ply fairing pieces into position between the fuselage and wing root. When happy with the fit, glue them along the fuselage edge only. When the glue's dry, the wing can be removed, whereupon the fairing should stay in position at the correct angle. Cut out the soft 1.5mm balsa profile shown on the plan's fuselage side view, then roll it to achieve the correct shape before gluing it,



COWL CROSS SECTION Balsa

STANDARD SIZE SERVOS SHOWN

# SPITFIRE

## MK9

57mm (2.25") SP

4.5mm Balsa  
FIN & RUDDER

RE MK9  
BY TONY NIJHUIS

SPECIFICATION:  
MOVEMENTS - ELEVATOR: 10mm  
WING: 12mm TRIANGLE  
WING: 2mm Balsa  
LENGTH: 100mm  
WING: 100mm  
WING: 100mm

4.5mm Balsa  
SIDES  
USE OF ELEVATOR  
CHAMFER LEADING  
6mm Balsa  
SHEET

NOSE TUNE FROM 3mm LITE PLY

4.5mm Balsa  
TAILPLANE &  
ELEVATORS

3mm LITEPLY  
FORMERS

6mm SQ. Balsa  
LONGERONS

4.5mm Balsa  
SHEET

1.5mm PLY  
FAIRING

6mm Balsa  
AILERON-SPAR

1.5mm Balsa  
SHEETING

2 1/4" SPINNER

COWL BUILT-UP  
FROM Balsa

SOLID 1.5mm Balsa  
SPAR WEBS

3mm LITEPLY  
DOUBLER

2.5mm Balsa  
WING RIBS

4.5mm Balsa  
SUB-L.E.

9mm Balsa  
SIZE L.E.

SOLID Balsa  
WING TIPS

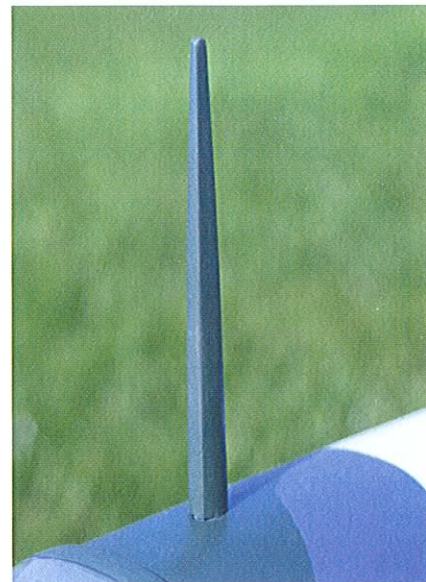
6mm SQ. OBECHE  
MAIN SPARS

10mm WING BOLT AND CAPTIVE NUT

BALANCE POINT  
FEATHER BOLT  
LEADING EDGE OF WING

DESIGNED BY TONY NIJHUIS





first to the fuselage, then the ply fairing. The forward piece of the fairing is made from solid balsa and shaped to blend in with the rear sheeting. Refit the wings, then fashion the forward wing fairing from solid balsa before blending this into the forward under-section.

The airframe is now nearly complete, requiring just the stabiliser to be cut out and fitted. With this done, a small infill piece will be required on the fuselage, just above the stabiliser. (Note that the fin isn't fitted until the remainder of the airframe has been covered).

## COVERING

It's up to you when you fit the canopy, but cockpit detailing and fitting should be done before covering. Choose your covering medium (I used silver Solarfilm on the prototype) and apply it to the airframe. With this done the fin can be fitted. Make up and fit the elevator torque rod and add all the control surfaces using Mylar hinges, secured with glue and pins.

Fit the servos and elevator control horn and complete the control rods. Install the Rx, NiCad and switch harness, making sure the C of G is as specified on the plan. Oh, and do check that all the control surfaces move freely!

When the radio installation is complete a coat of Prymol (Solarfilm etching primer) should be applied prior to painting with Humbrol enamels No. 28, 30 and 64.

*Don't stint on the scale details; they make all the difference to the finished model.*

using black and white Solarfilm. To add a touch more realism I made some exhaust stacks from balsa, which were painted black prior to gluing in place. Now then, before fitting the canopy don't forget to add a pilot. Perkins Distribution do a medium-size NATO jet pilot who's almost

## ORDER LIST

Item	Code	Price
Canopy	COWRC2038	£4.55 plus p&p
CNC wood selection	CNCR2038	£44.95 plus p&p

To place an order call Encanta Customer Services on tel. 01689 899228 / 229

## FINISHING

For the decals either paint the roundels on or use Solartrim. The squadron markings on the prototype were painted on, whilst the invasion stripes were made

ideal. Okay, he may not be from the right era but he's nearly the right scale and does finish the model off.

## MAKING ANGELS

As this Spitfire is based on my previous smaller design the critical parameters such as C of G and control throws were pretty well known, so launching the model for the first flight didn't provide any usual levels of trepidation. With the help of a firm launch the Spitfire climbed away without fuss and with very little 'sink', inspiring confidence from the outset. By the first turn everything felt right about this model: power, agility and stability; a real pussycat.

Alas, after one circuit I was shaken from my pleasure-rush as the engine decided to cut. I needn't have worried, though, as the Spitfire's power-off handling proved to be very user-friendly. Feeling a little aggrieved





*Rest assured, she won't drop a wing, so landings are a breeze.*



that my flight was cut short I decided to perform a dead-stick 'Farnborough pass' before landing. Editor Graham, who had a serious intention of buying my model, watched with a worrying unease (he won't buy a repaired aeroplane, you know, it's got to be perfect). But this model wasn't going to bite. In truth it does exactly what you ask of it. So after that bit of drama (for Graham, that is), the model was easily and safely landed. Unfortunately, with the light now fading it was time to pack up for another day, although we'd cunningly

earmarked the following morning for another sortie. Returning to the field in daylight, the Spitfire was again sent skyward. The power delivered by the .25 two-stroke proved quite adequate, the model performing most manoeuvres expected by a Spitfire. Barrel rolls and loops are a delight, but it excels at low, fast passes pulled into a half-roll and reversal, brilliant! There really are no vices with this model, it goes where you point it and does exactly as you ask. Who could ask for more?

## DATAFILE

<b>Name:</b>	Spitfire Mk.9
<b>Model type:</b>	Semi-scale warbird
<b>Designed by:</b>	Tony Nijhuis
<b>Wingspan:</b>	46" (1168mm)
<b>Fuselage length:</b>	36.5" (930mm)
<b>Wing area:</b>	384sq. in.
<b>All-up weight:</b>	2 lb 8oz (1.1kg)
<b>Wing loading:</b>	15oz / sq. ft.
<b>C of G:</b>	70 - 75mm from root i.e.
<b>Rec'd motor:</b>	.25 two-stroke
<b>Control functions:</b>	Aileron, elevator, rudder, throttle
<b>Rec'd no. channels:</b>	Four (five serves)