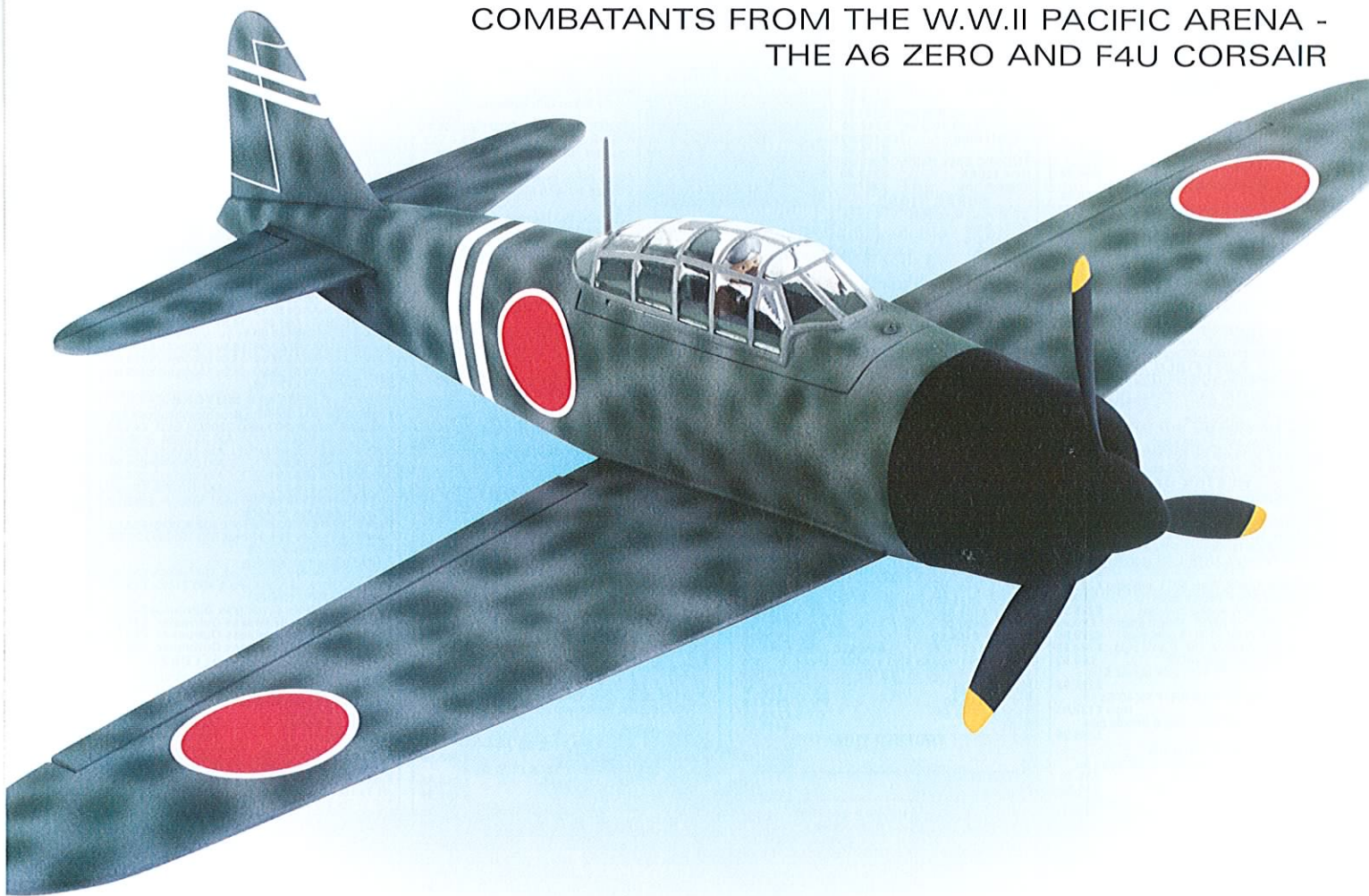


Dogfight double

TONY NIJHUIS PRESENTS A PAIR OF DUELLING
COMBATANTS FROM THE W.W.II PACIFIC ARENA -
THE A6 ZERO AND F4U CORSAIR



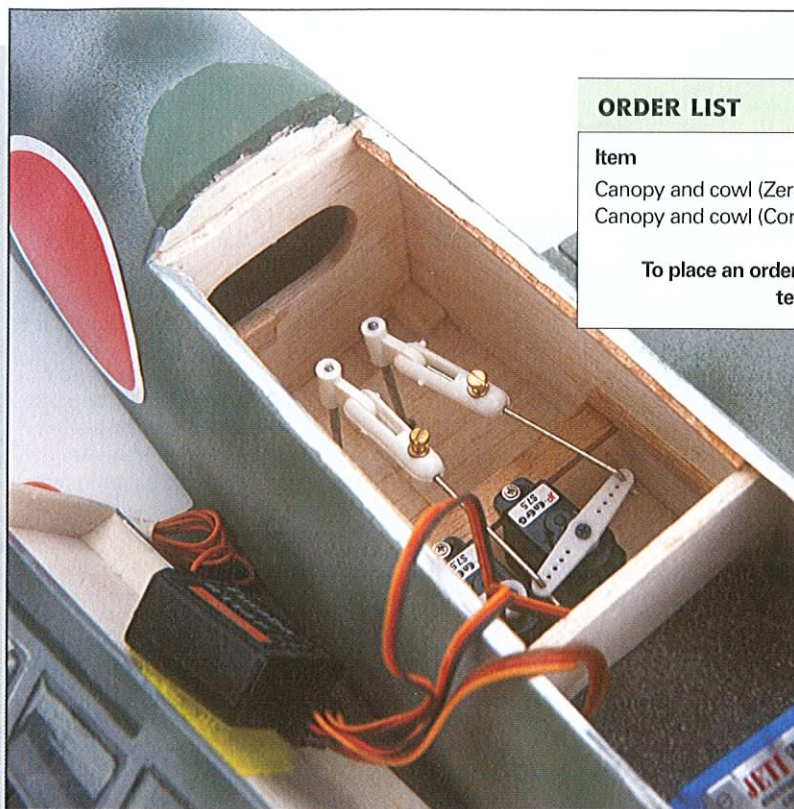
The first of Tony's dogfight series to use brushless motors and Li-Po cells, these cracking little models use an 'off the shelf' powertrain solution that's readily available from FlightPower.

This is the fourth in my 'dogfight double' series, and one that, quite frankly, I've been itching to do. Since beginning the series some five years ago with the Spitfire and Me109 the pace of electric flight technology has cracked on relentlessly, with seemingly no bounds. The early models relied on Speed-400 brushed motors, Gunther props and 9.6V 800AR NiCad packs. Oh how times have changed, indeed those of you who aren't keeping up really are missing out. I should know, as it was only last year that I became a convert to Lithium Polymer batteries and brushless motors. Something I should have

done a long time ago perhaps? Well no, actually. With any new or evolving technology it's not always worth buying cutting edge products just after their appearance on the market, usually because of unknown limitations and cost, which can make it prohibitive to the average modeller who has but a modest budget at his disposal. However, there is a time to jump on the bandwagon, but only when the benefits mostly outweigh the old technology.

On to these new models, then, and the first thing you'll notice about them is that they're powered by brushless motors and Li-Po batteries. Such brushless / cell

combinations can bring awesome power, longer flight times and provide a much lighter, more refined model. One key factor that always seems to lead to confusion is the motor, battery and prop set-up. In fact, it's something your local model shop may even struggle to provide. Fortunately, however, FlightPower (www.flightpower.co.uk) have come to the rescue with their tailor-made flight packs. These contain the motor, battery, prop and driver, motor mount and power connectors. They can also supply the speed controller, too. This 'Evolution Synergy' range extends from a Shocker set-up through park flyer and

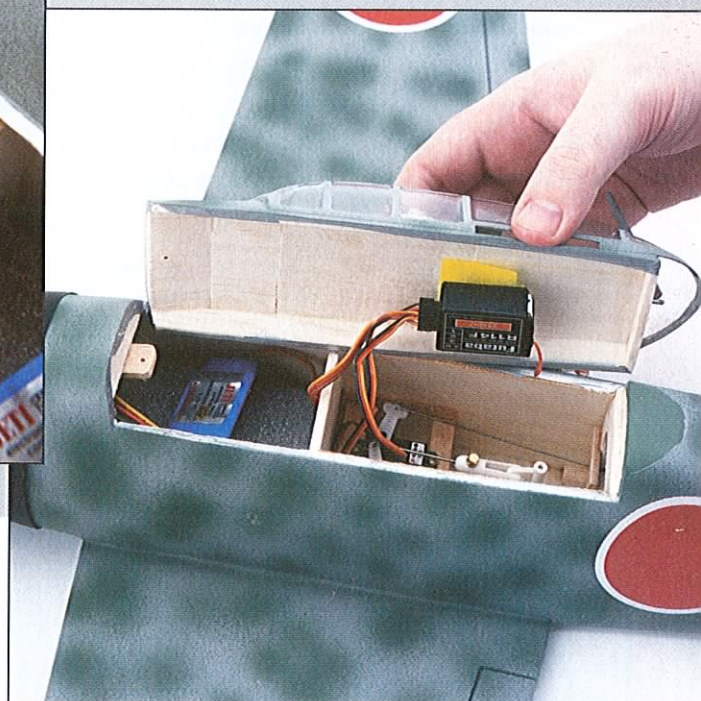


ORDER LIST

| Item | Code | Price |
|---------------------------|-----------|-----------------|
| Canopy and cowl (Zero) | COWRC2035 | £11.00 plus p&p |
| Canopy and cowl (Corsair) | COWRC2036 | £11.00 plus p&p |

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Canopy hatches on both aeroplanes allow suitable access to the radio and battery. Note the location of the receiver, Velcro fastened to the lid of the hatch.



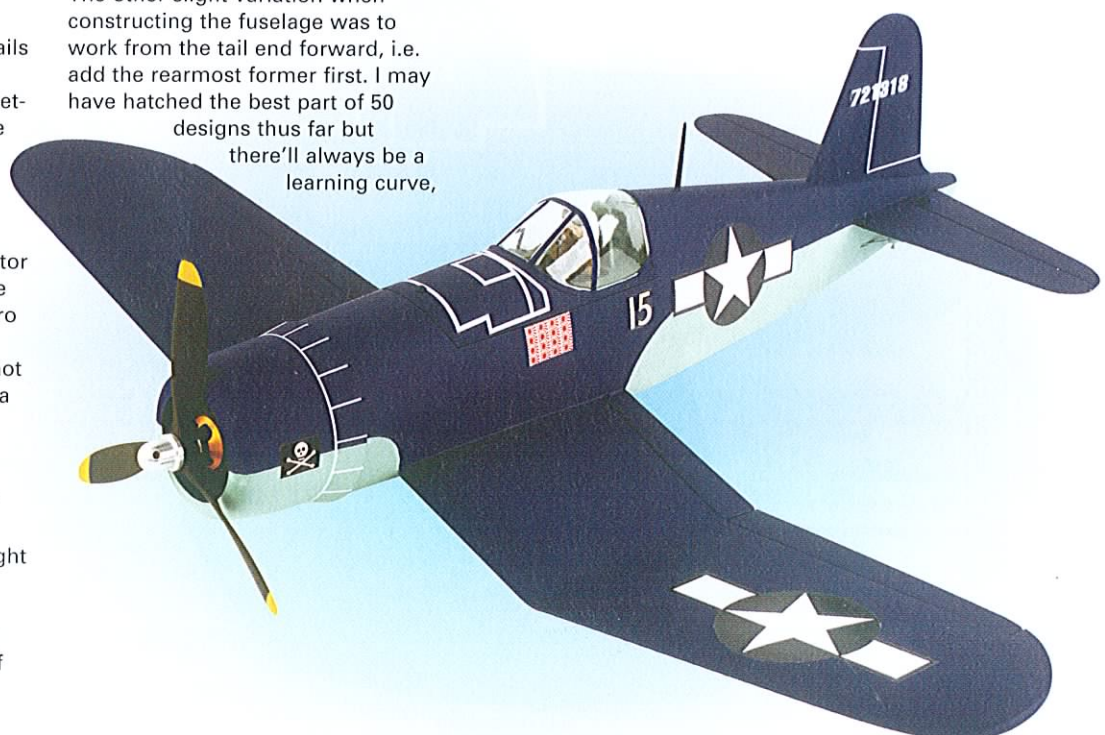
all the way up to a 90cu in. i.c.-equivalent pack. Even if the pack doesn't quite suit the application you have in mind, give FlightPower a call and the guys there will use their extensive knowledge to find something that will.

Being a bit of a Luddite I gave Andy Kirby at FlightPower the details of the new models, and he suggested the Evolution Park Fly set-up. So, with total confidence in the power system it was time to move on with the design. Choosing the subjects really wasn't that difficult as the suggestion from our esteemed editor only reinforced my own preference to build both the Mitsubishi A6 Zero and the Vought F4U Corsair; both particular favourites of mine, but not the easiest of models to design in a straightforward manner!

CONCEPT

Now, I'm not a great fan of 'round' fuselages as they're usually fiddly and time consuming, but the thought of making a slab-sided Zero or Corsair was more than my 'scale conscience' could bear! However, I had a cunning plan. Using the 'half and half' approach, I decided to

semi-roll the sheet fuselage sides, slab the top and bottom with thicker sheet and then shape to a semi-round finish... hey presto! A nicely contoured fuselage in double-quick time. The other slight variation when constructing the fuselage was to work from the tail end forward, i.e. add the rearmost former first. I may have hatched the best part of 50 designs thus far but there'll always be a learning curve,



Datafile

| | |
|---------------------------|-------------------------------------|
| Name: | Mitsubishi Zero and F4U Corsair |
| Model type: | Electric fun-fighters |
| Designed by: | Tony Nijhuis |
| Wingspan: | 32" (Zero); 31½" (Corsair) |
| All-up weight: | 16 - 25oz |
| Wing loading: | 15oz / sq. ft. |
| Fuselage length: | 23" (Zero); 24" (Corsair) |
| Rec'd motor: | AXI 2208/20 Silverline |
| Rec'd battery: | 1050mAh 2s1p Li-Po |
| Rec'd propeller: | APC 8 x 4" electric |
| Rec'd ESC: | 10amp (Li-Po compatible) |
| Control functions: | Aileron, elevator, rudder, throttle |

Producing nicely rounded fuselages for both models, whilst also keeping the design simple, was initially a bit of a head-scratcher. However, as usual, old Tony came up trumps!

and coming up with new ideas still provides immense satisfaction.

Radial engines dictate round cowls and in this respect a pair of vacuum-formed items would be the order of the day, both to help me produce a near-scale fuselage and to provide less work for the builder... see, I do look after you!

The remainder of the construction is similar to that of my earlier Spitfire and ME109 dogfight double.

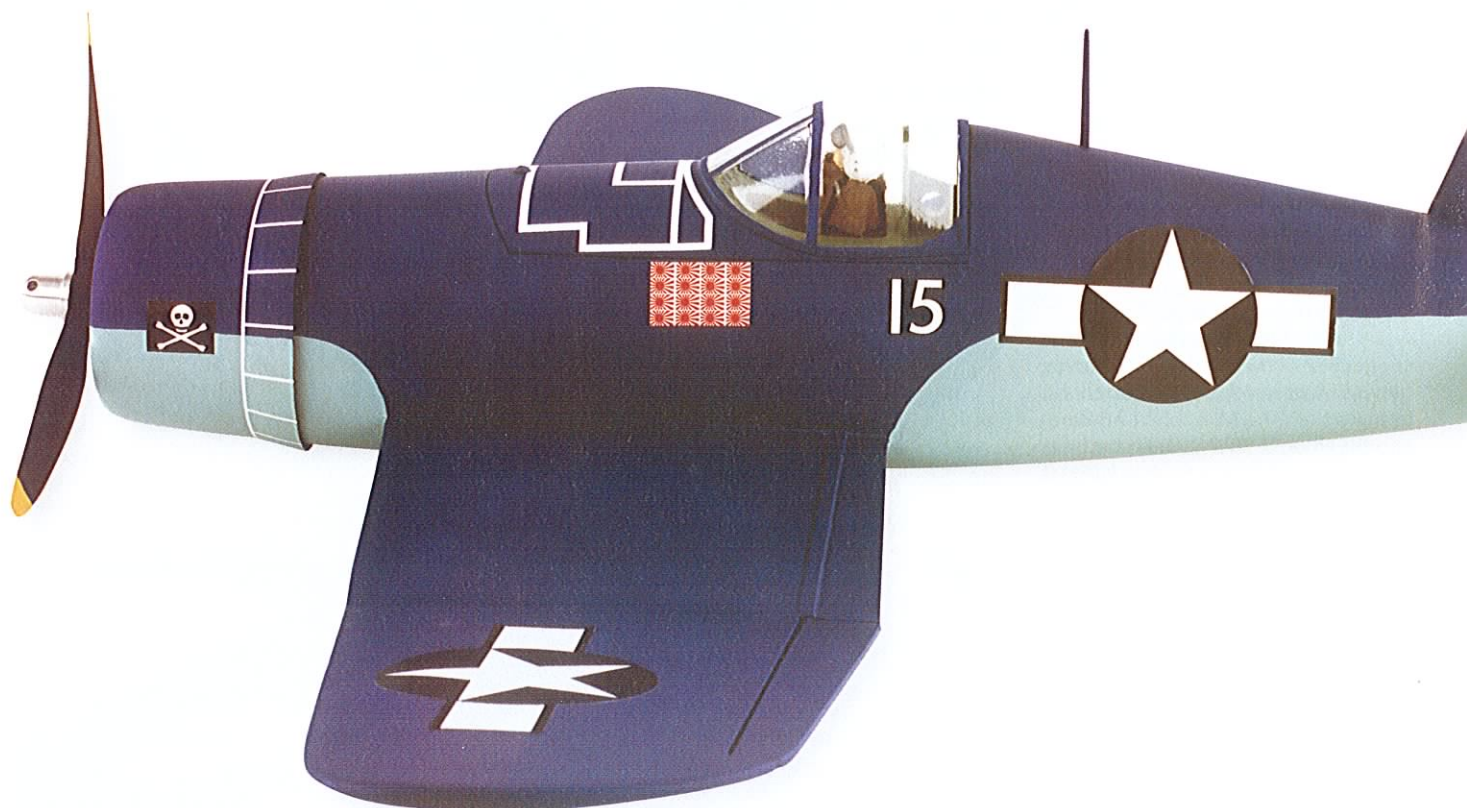
The only real deviance being with the Corsair wing, which has that familiar 'inverted gull' shape. This was my only concern when designing the model, bearing in mind I was going to use tried and tested ¼" sheet balsa for the wing. The first problem was, would conventional aileron torque rods work on a cranked wing? Just about! Take a look at the plan and you'll see that the location of the rod buried into the aileron is quite critical. In fact the torque rod is only effective over a small degree of movement before the geometry tends to screw things up a bit. The bottom line, though, is that there is sufficient aileron deflection available to control the aeroplane in flight, as proven on the prototype. It would be easier, of course, to fit a couple of GWS Pico servos or similar through the wing and directly couple the ailerons this way. Look at the plan again and you'll see this method as an alternative option. The choice is yours!

Okay, that's enough background, on with the build. As both models share similarities in construction I'll generalise the build sequence but expand in detail on each model where necessary.

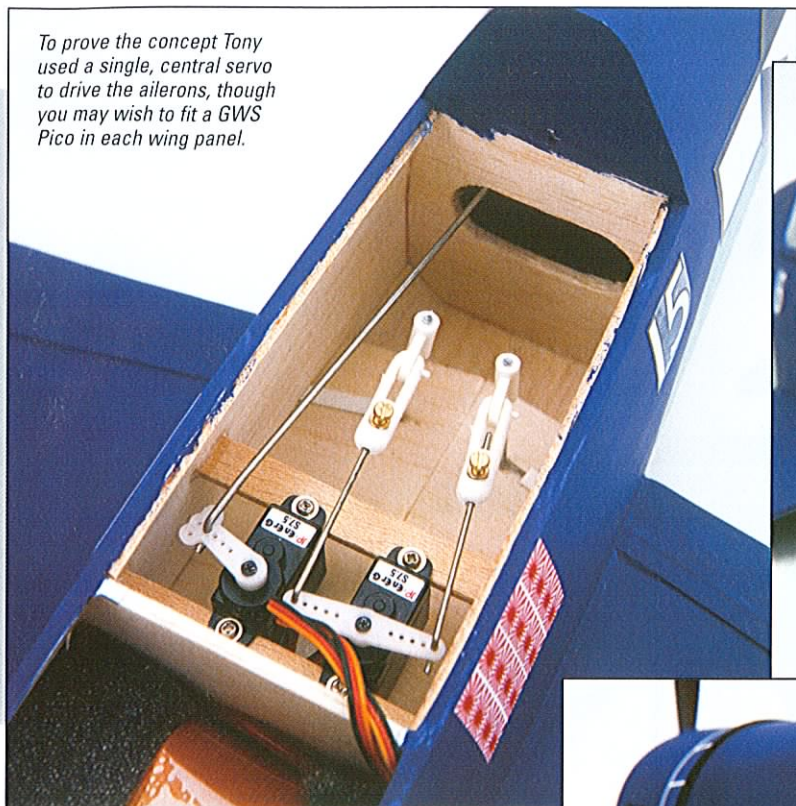
WINGS

Cut out the wing parts from ¼" medium density balsa sheet to form a pair, plus the wing spar. Weigh the individual bits and interchange them in order to achieve a single component of equal balance, after which you can glue the parts together. For the Corsair don't join the wing panels at the 'crank' point just yet as you need to profile each panel first. From the plan, locate the area of balsa to be profiled and highlight this on the balsa using a pen. With the wing panels flat on the building board, use a razor plane to shape them to the first stage of completion. Now either continue with the plane or use a sanding block and begin the second stage of profiling. Use one of the fuselage sides to achieve the correct profile at the wing root and, when happy, use a medium to fine grade abrasive paper to finish both wings panels to a smooth, flowing section. For the Corsair, make sure the profiles of the inner and outer panels are roughly the same where they join.

Cut out the ailerons, then channel out a slot (using the threaded end of a pushrod as a file) for the aileron torque rods. For the Zero the aforementioned groove will need to



To prove the concept Tony used a single, central servo to drive the ailerons, though you may wish to fit a GWS Pico in each wing panel.



Fear not, you won't have to tackle the radial cowl in wood, we've made a plastic one for you!



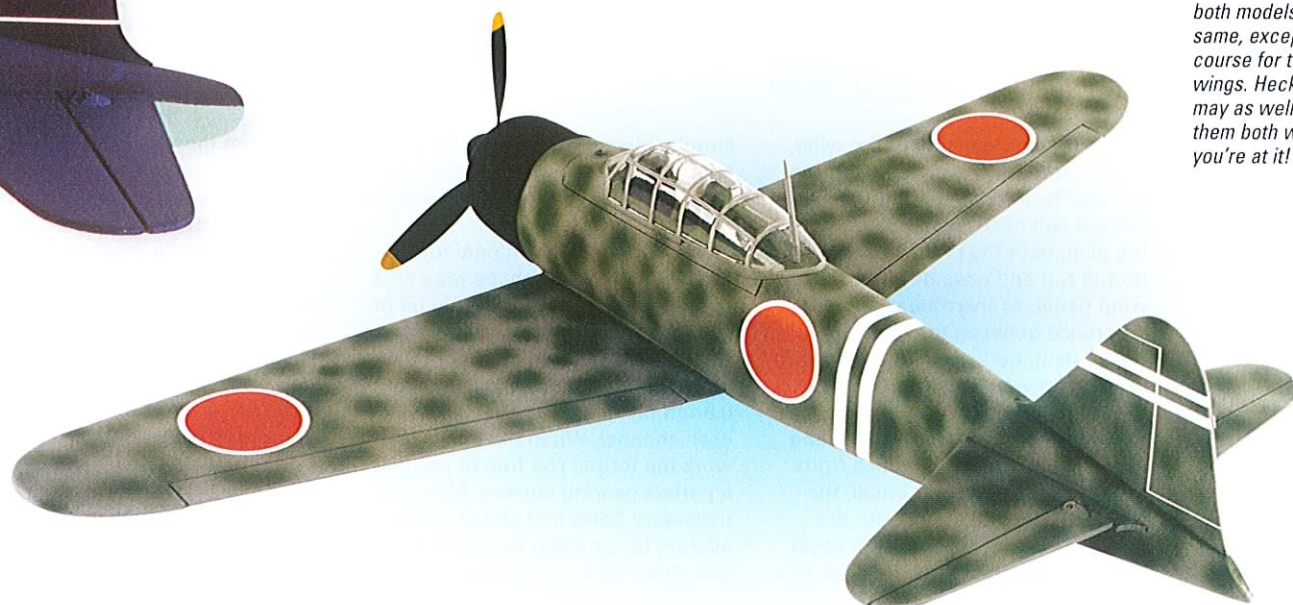
Basic cockpit and fuselage details make a real difference to the overall appearance of these models.



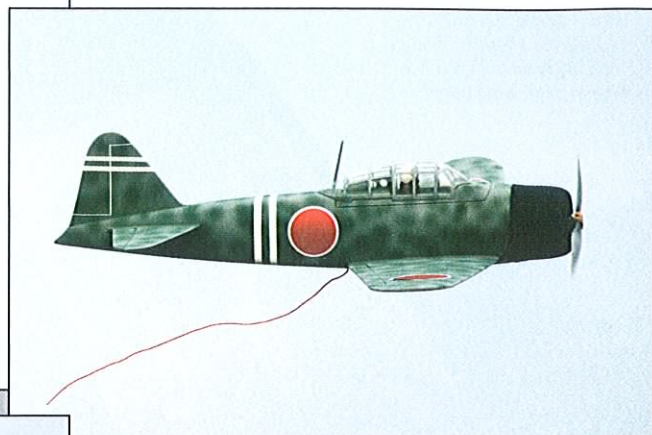
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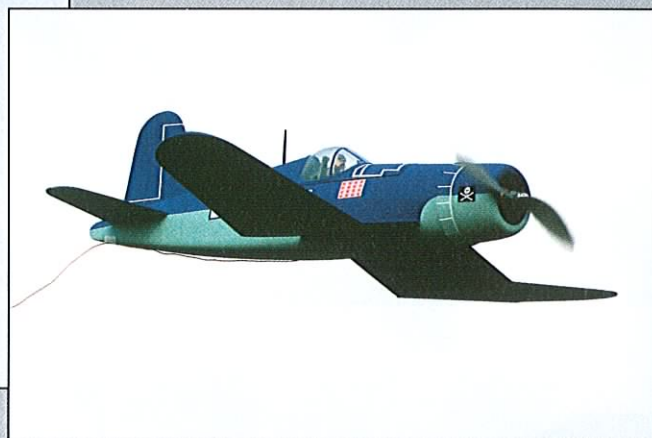
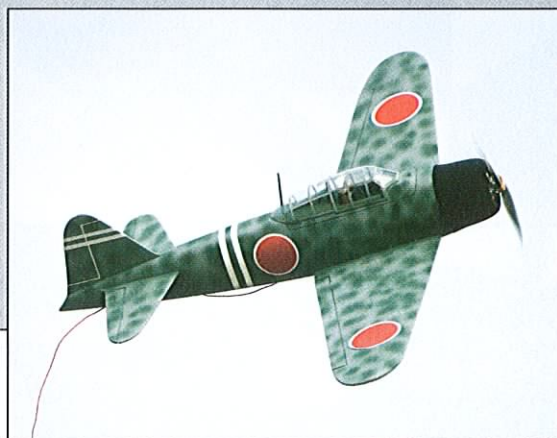
The construction for both models is the same, except of course for the wings. Heck, you may as well build them both while you're at it!



With the brushless set-up the Corsair really is a hot little aeroplane.



Ideal for a Sunday afternoon dogfight, this pair certainly conjure up imagery of the conflict in the Pacific.



“In order to provide less work for the builder, a vac-formed cowl was the order of the day.”

These models really do fly as well as they look, in fact the Corsair is probably a little overpowered. More on this next month...

be cut in the underside of the wing, whilst the Corsair will need it in the top profile. In both cases the finished surface will need to be flush. From the plan, note the point where the torque rod end rises through each wing panel, as there's a slight difference between the two.

As mentioned earlier there are two options for aileron control on the Corsair - use either torque rods or fit individual servos in each wing, one for each aileron. You'll notice from the plan that, whilst it's small, the Pico servo will still penetrate the upper surface of the wing. To cover the exposed base, then, you can fit a

simple 'blister' made from a plastic spoon. The servo lead can then be fed back through the wing and taped flat to the underside.

If you're using traditional torque rods, bend them to shape then coat the bearing surfaces with thin oil or grease before fitting to their respective channels. To secure the rods in place cyano' a thin strip of 0.8mm ply or plastic over the top of each channel. When the glue's dry, work the torque rod free to produce a perfect bearing surface. Make the necessary holes and slots in each aileron, locate them into position and check for free movement.

Now trim the root of each wing panel to achieve the correct dihedral, fit the brace to one side and join the panels together. In the case of the Corsair, fillet the cranked wing joint with filler and blend to a smooth, flowing curve. Fettle the wing using fine abrasive paper to round off the leading edge and wing tips.

THE BELL TOLLS...

For last orders at the bar, that is! Excuse me whilst I disappear, there's a rumour that the ed's going to buy a round... this I have to see! Next month we'll complete the build and unleash this pair skywards.

Dogfight Double

TONY NIJHUIS CONCLUDES THE BUILD OF HIS LATEST BATTLING BRACE, THE A6 ZERO AND F4U CORSAIR

Construction of these models is simplicity itself. The fuselage, for example, begins life as a pair of soft-grade balsa sides, cut to accommodate the required curvature.

I always cover the tailplane and fin prior to installation, then glue them in place before painting.

Cast your mind back to last month's issue and you'll recall we exited the workshop with a nicely sanded wing. This time around I'll take the build through to its conclusion, starting with the fuselage.

Right then, fabricate a pair of fuselage sides in accordance with the plan, using a soft grade of balsa that will easily bend to the required curvature without splitting (you can check the wood's suitability by rolling it around a tin can or similar).

Cut all the fuselage formers, then glue lengths of 6mm square (Zero) and 9mm triangular (Corsair) balsa



Slightly out of period maybe, but this NATO style pilot from J. Perkins does an admirable job of occupying the hot seat!

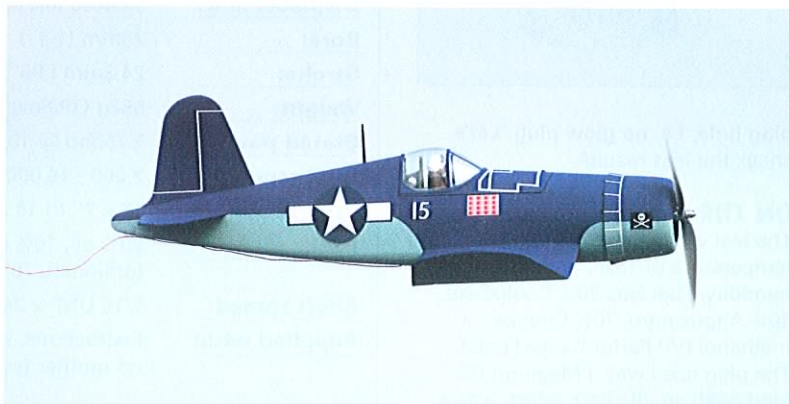
to the bottom / rear section of the fuselage sides. Chamfer the 6mm square so that the rear edges of the sides can be pulled together. Now fit the rear former (positioned just behind the wing at a slight angle) to one fuselage side. Add the other

fuselage side and check alignment by pinching the tail end of the fuselage together before gluing.

Okay, glue the sides together at the back and note how the fuselage gains valuable rigidity. The firewall can now be glued into position,

bearing in mind that this will, of course, necessitate some bending of the forward fuselage sides. To assist in the process, lightly wet the wood from the front to around the midpoint. Dry-fit the firewall using either tape or elastic bands and make any adjustments required before gluing in place with thin cyano'. The remaining formers can now be installed (in no particular order).

Trim the top and bottom edges of the fuselage flush with the formers and apply the upper front and rear sheeting. You may notice the upper rear fuselage bulging a little between the rear formers, in which case pinch the sides in slightly before gluing the top sheet in place. Any slight bulging that still remains can be removed with the sanding block once the top is in position. Fit the cockpit floor and add the lower forward and rear sheeting; when dry shape both top and bottom sheeting to the finished profile. Take a quick breather, then proceed by cutting the slot for the fin and (for the Corsair only), fit the canopy rear former to the cockpit floor). Sand the fuselage to the finished profile, then add the two servo support rails to suit your chosen units, which should ideally be micro or high torque Naros. Do note that anything larger will cause a problem with the aileron connections.



The Corsair is a sprightly and capable performer with bags of power in reserve.



Offer the wings to the fuselage, checking alignment before gluing into position. On the Corsair, fit the intermediate former in the position shown on the plan. Now cut a length of sheet balsa to make the underbelly (you'll need to wet the outer surface of the plank in order for the wood to bend to the profile required). This area is less complicated on the Zero, which requires a simple piece of sheet balsa fitted directly to the wing underside, lightly sanded to match the fuselage profile.

With a hacksaw blade, cut the main access hatch as indicated on the plan. Fit the locating pin and the hatch retaining plate, then drop the hatch back into position and drill a hole for the retaining screw. You may find that the fuselage sides slightly when the hatch is removed, though this can be cured by reinforcing the inside edge of the fuselage (along the hatch line) using pieces of 3mm square spruce or obechi. With this complete, refit the hatch and sand both this and the fuselage side flush with each other. Finally, strengthen the wing-fuselage joint by running a fillet of glue along the joint on the inside of the model.

TAILPLANE & FIN

Like many models of this ilk the tail feathers are constructed from medium / hard 3mm sheet balsa, and only need the edges to be sanded / chamfered as required to complete. Make up the elevator torque rod, remembering to add this before fitting the tailplane! Oh, and don't fit the tailplane and fin until after the remainder of the model's been covered, otherwise you'll find that covering those tight corners is the devil's own job.

FITTING OUT & COVERING

Fitting the motor and radio can be done quite easily when the model's complete, although now's a good time to fit the motor mounts and check the clearances with the cowl in situ.

I prefer to add the canopy and complete any cockpit detailing prior to covering. Also, don't forget that a pilot is a must! J. Perkins supply a small NATO jet jockey, which although not from the right era is



the control surfaces hooked up fit the motor, speed controller and receiver and set the control movements to the deflections suggested on the plan.

To do your model visual justice, give it a decent paint job. Solarfilm covering has to be etch-primed with Prymol prior to painting, after which it's just a case of applying an appropriate scheme. For the prototypes I used Humbrol enamels:

Slightly larger and heavier than the Zero, the Corsair should be flown using the medium power option specified on the plan. The FlightPower EVO Synergy park fly package fitted to the prototype is ideal.

The Corsair leaps away from a hand-launch with rocket-like authority.

With the varied schemes that are available the Zero is sure to be a popular choice, especially as it flies so well!

Since they're built from 3mm balsa sheet, fin and tailplane construction doesn't get much easier than this!



the right scale and finishes the model off very nicely.

Both prototype airframes were covered in silver Solarfilm. Starting with the fuselage and wing, the tail feathers can then be treated and, finally, attached to the airframe, remembering to remove the necessary areas of film to ensure good wood-to-wood joints. Fit all the control surfaces with Mylar hinges and secure with glue and pins. Add the servos and elevator control horn, and make the elevator and aileron control rods. With all



Both prototypes were finished in appropriate schemes, sprayed over Prymol-etched silver Solarfilm.

In each case the access hatch is a simple affair, retained by a single screw.

matt dark blue and matt sky blue for the Corsair and matt light grey 'spray speckled' with matt dark green for the Zero. Of course, one of the nice things about electric models is the paint job won't be ruined by fuel, though I do still like to seal the painted surface with a thin dusting of matt spray varnish, if only to keep finger prints and other greasy marks at bay!

Decals can be either painted on or cut from Solartrim. Oh, and incidentally, the American insignia on my Corsair was supplied by Pyramid Models, ordered on line at www.pyramidmodels.com



Which to build? Heck, why not avoid the dilemma and do both? Grab your best flying buddy and get dogfighting!



and intermittent rain showers I hot-footed it to the patch. Ankle deep in mud, I launched the Zero with control movements set to the maximum possible. It wasn't so much a case of launching, rather just letting go... the model immediately shot skywards without any fuss at all. With a small amount of down and right trim she was soon being tossed around the sky 'hands free'! If the model can handle this foul weather, I thought, I can't wait to fly her in 'suitable' conditions. All the control movements were a little sensitive so I introduced 50% rates, which calmed everything down a little. Alas after just 3 minutes of play the rain started to fall and I deemed that enough was enough. I duly guided the Zero onto finals and slowed her up for a greaser of a belly landing, during which she displayed no tendency to stall at any time. You'll notice some power options on the plan, and for the prototype Zero I chose the lighter version. I was pleasantly surprised with the results, although between $\frac{3}{4}$ and full power was used throughout the flight.

I decided not to subject the Corsair to the same inclement conditions and chose instead to wait patiently for better weather. When it finally arrived I was ready and waiting, the model equipped with the new FlightPower EVO Synergy park fly package. With the aid of 'The Aviator' Colin Hammond to launch, the Corsair leaped away at an alarming

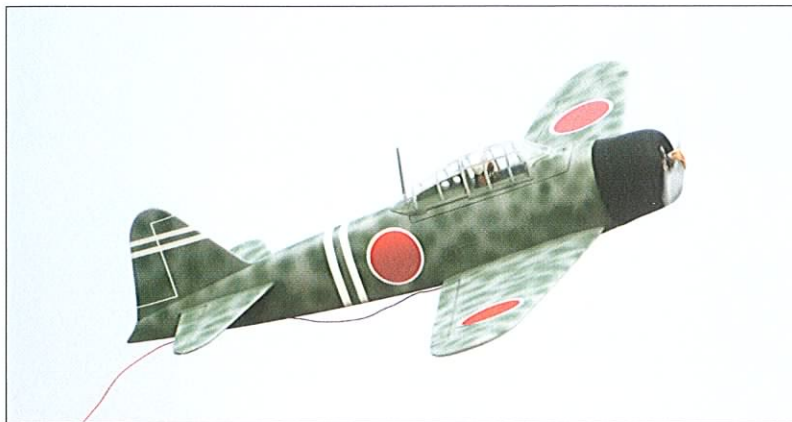
UP AND AT IT

For most UK based designers, building models in January probably means a long wait before sensible test flying in ideal conditions... But I don't do sensible when it comes to test flying, in fact the only thing that stops me is if it's dark and I can't see! So, unperturbed by gale force winds

ORDER LIST

| Item | Code | Price |
|-------------------------|-----------|------------------------------|
| Canopy / Cowl (Zero) | COWRC2035 | £11.00 plus post and packing |
| Canopy / Cowl (Corsair) | CNCRC2036 | £11.00 plus post and packing |

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rate of knots! Slowing her to $\frac{1}{2}$ throttle calmed things a little, and rates were again quickly switched in. Just a whiff of trim was added to the elevator and ailerons, and within a minute I was thoroughly enjoying this little aeroplane. Even Colin was tugging at the transmitter neck strap for a go. He might have 'Large Model Association' tattooed across his forehead but he does like the challenge of the small stuff, you know! After 15 minutes or so it was time to bring the Corsair back to base

with another perfect landing, again with no signs of a stall at low speed.

ALL BOXES TICKED

Both aeroplanes very capable with sufficient power to carry out most manoeuvres. Expect flight times of around 5 minutes from the light power set-up and 15 minutes plus from the Evo Synergy package. Whilst you can expect a similar performance from each model, the Corsair is slightly bigger / heavier and benefits from the 'medium power option'.

On a final note, the motor and battery combinations suggested require a small amount of ballast to achieve the correct C of G. As there's little scope for moving the battery pack forward be prepared to add some self-adhesive weights to the inside of the cowl. All in all they're cracking little aircraft, so get busy... there's still time to put 'knife to balsa' for some autumn flying fun!

Despite the bad weather the Zero acquitted itself well, although it was a little lively at first.

Datafile

| | |
|---------------------------|--|
| Name: | Mitsubishi Zero & F4U Corsair |
| Model type: | Electric fun-fighters |
| Designed by: | Tony Nijhuis |
| Wingspan: | 32" (Zero); 31 $\frac{1}{2}$ " (Corsair) |
| All-up weight: | 16 - 25oz |
| Wing loading: | 15oz / sq. ft. |
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| Rec'd motor: | AXI 2208/20 Silverline |
| Rec'd battery: | 1050mAh 2s1p Li-Po |
| Rec'd propeller: | APC 8 x 4" electric |
| Rec'd ESC: | 10amp (Li-Po compatible) |
| Control functions: | Aileron, elevator, rudder, throttle |