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VOL.68 NO.4 APRIL 2025

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RCM&E

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Welcome

Welcome to the April 2025 issue of RCM&E.

It's that time of year when even feeding the birds in my garden is fraught with risk. The feeders hang from a tree at the bottom of the lawn, the end of which is on a slight slope. But, as has become usual in recent years, after weeks of wet weather, interspersed with damp, overcast conditions that do nothing to help dry out conditions underfoot, the end of said slope has become a short mudslide. I have yet to end up 'base over apex' but it's been close!

It reminds me of the flying session I had at around this time last year when, checking out a large puddle in the adjacent field as a possible venue for some impromptu floatplane flying, I stood on its muddy margin, only to find my wellies stuck in the mire! In the escape attempt that followed one boot refused to budge whilst the other came away with such urgency that it propelled me forwards. I naturally put my arms out to cushion the fall, an act which was to lead to eight months' worth of shoulder pain and several physiotherapist visits.

Another slip a few years ago, when walking down a muddy hillside following a slope soaring session, saw me land backwards. The ensuing leg pain again saw me seeking medical help, eventually resulting in the replacement of my right hip.

So do take care out there, especially when things are so wet and muddy. It's very easy to take a tumble at a model flying site, as I know to my cost. I'd like to think that I will be sensible and stay at home until the local flying fields have dried out a bit, but I know that as soon as the sun shines, even briefly, that I'll be out once again, such is my addiction to aeromodelling.

As for my garden slope, that's going to be levelled out this year to ward off possible future peril. I just hope I don't get too distracted by any fine weather flying!

Now, let's look at the main articles this month. Yours truly kicks things off with a review of XFly-Models' new Supermarine Spitfire kit in D-Day markings, then it's over to Mike Roach who upscales the Keil Kraft Avro 707 plan to suit 50 mm EDF power. Next, I'm back with a look at a neat little electric pylon racer, the EPS-3 from J. Perkins. Chris Williams is the first of this month's columnists and in 'Scale Gliding' he shows how to attach the canopy of a scale glider to its frame. In 'Model Magic', Stuart Mackay puts together Hangar 9's big kit for a Pitts Special biplane. This month's pull-out Pro-Plan is by Mike Freeman, whose 1M span EDF flying wing, 'St8us' is built entirely from foamboard and brown paper. 'One Man & His Shed' finds Dave Goodenough wearing a new T-shirt before embarking on another selection of workshop-based advice and guidance. Continuing from the last issue, in 'Drawing A Plan - Part 2', Lindsay Todd describes his final steps in drawing a plan for a semi-scale aircraft before our 'Insider' columnist John Stennard offers more indoor flying topics, starting with a tri-motor helicopter. In 'Modelling the Barling Beast' Jon Harper details his scratch build of a 72" model of the six engine 'Barling Bomber', then it's over to Jeff Barringer for our final feature as he reports from the other side of the world after building a rather quick slope soarer, the Angelwings SOAS.

I hope you enjoy reading it all.

Happy Flying!

Kevin Crozier

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On the cover

Photo: XFly-Model

In the last issue we introduced a pair of new Supermarine Spitfire Mk.IX kits. Developed by XFly-Model, in collaboration with their UK distributor CML Distribution, two versions are being offered, one in desert livery and the other being for MK392, the aircraft which ace 'Johnnie' Johnson flew during the Normandy landings, complete with invasion stripes. In this month's build review we will be taking a closer look at one of the first production kits of this famous fighter.

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Switch on

Our latest round up of model flying news and miscellany

July 2024's ModelAir event at Old Warden may have been the last at this famous airfield. This picture, courtesy of Dave Goodenough, shows a trio of WW1 R/C biplanes with the often-pictured farm buildings in the background.

MODELAIR AT OLD WARDEN

We recently received an update about the immediate future of the popular ModelAir aeromodelling events, which have been held at Old Warden airfield for many years.

Emma Chase provided us with the following statement on behalf of the ModelAir team:

"Since the July 2024 model flying event, we have been working very hard trying to secure the future of model flying events at Old Warden, which we ran on behalf of Shuttleworth, but to no avail.

Our last course of action was to appeal to the Shuttleworth trustees who have replied with a letter which basically says that Shuttleworth will no longer host model flying events on the airfield.

The trustees mention the use of the parkland for modelling events. We have thoroughly investigated all the locations proposed to us on the parkland and it is our opinion that these areas are unsuitable for the majority of our model aircraft disciplines for both practical and legal reasons. Therefore, we do not feel that relocating the model aircraft disciplines into the parkland is a viable option for us.

We will, however, continue to monitor the situation at Shuttleworth with regards to any future aeromodelling events.

Whilst we explore alternative options for 2026 for a full event this year, we would recommend that all our disciplines, apart from R/C, attend the SAM 35 events at the National Centre. Details can be found at https://sam35.org.uk/sam35-event-calendar/. *These events at Buckminster also include swap meets for all attendees, traders and car booters to get involved in. We are in discussions with SAM 35 to hopefully bring some of the Old Warden atmosphere to their events, especially at their June event this year. More details to follow.*

The National Centre also has lots of other events throughout the year to suit all modelling disciplines, so please take a look at the calendar: https://nationalcentre.bmfa.org/

We would like to take this opportunity to thank everyone who has supported aeromodelling events at Old Warden over the many decades and if July 2024 was the last model flying event at Old Warden, we are glad it was such a great weekend, enjoyed by so many of you."

SCALE INDOOR NATIONALS

April 2025 sees the return of the BMFA Scale Indoor Nationals to its established home at Walsall Campus Sports Hall, University of Wolverhampton, Magdalene Road, Walsall WS1 3TA.

The competition sees indoor scale aeromodellers converge on the West Midlands from across the UK and Europe to compete in the BMFA Scale Indoor Nationals.

On Saturday 26th April the Scale Indoor RC Nationals will take place, followed by the Scale Indoor FF Nationals on Sunday 27th. Competitors can enter both days by completing the electronic entry form found on the BMFA Scale Technical Committee Website at:
https://scale.bmfa.org

Spectators are also welcome and can view proceedings from the seated gallery area overlooking the sports hall. The fee for spectators is a bargain £5.00, allowing entry for both days (free for accompanied under 16s). There is ample free car parking for visitors on-site at the University.

Why not go along and take part or simply be inspired by viewing the best in UK and European Scale Indoor aeromodelling over the weekend of the 26th and 27th April.

For further details please contact: **enquiriesbmfascale@yahoo.com**

BOB JENNINGS CREATIVE

If you are a regular reader of RCM&E, especially whenever we have mentioned events hosted by the Power Scale Soaring Association (PSSA) then chances are that you will have seen some of the model aviation design and illustration work by Bob Jennings. Bob has recently been busy adding to his aviation art portfolio and writes:

"I designed the logo for the FAI World Scale Champs in 2026 and everything for the PSSA over the last couple of decades.

I have now developed a series of 17 aviation prints, printed on 300 gsm silk board, some of which are shown here. You can view the full set of prints on mobile or desktop at:

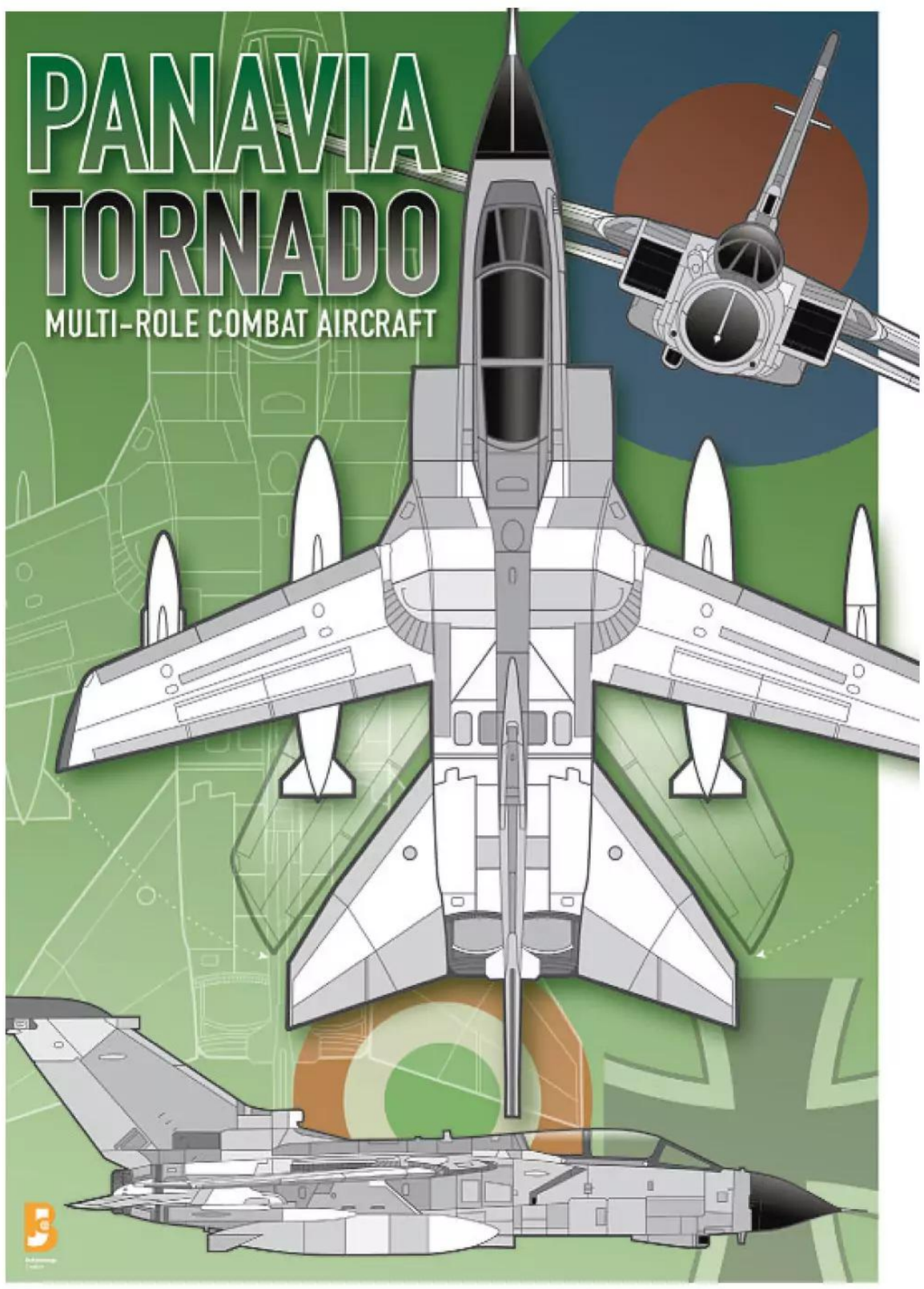
https://www.bobjenningscreative.com/prints/"

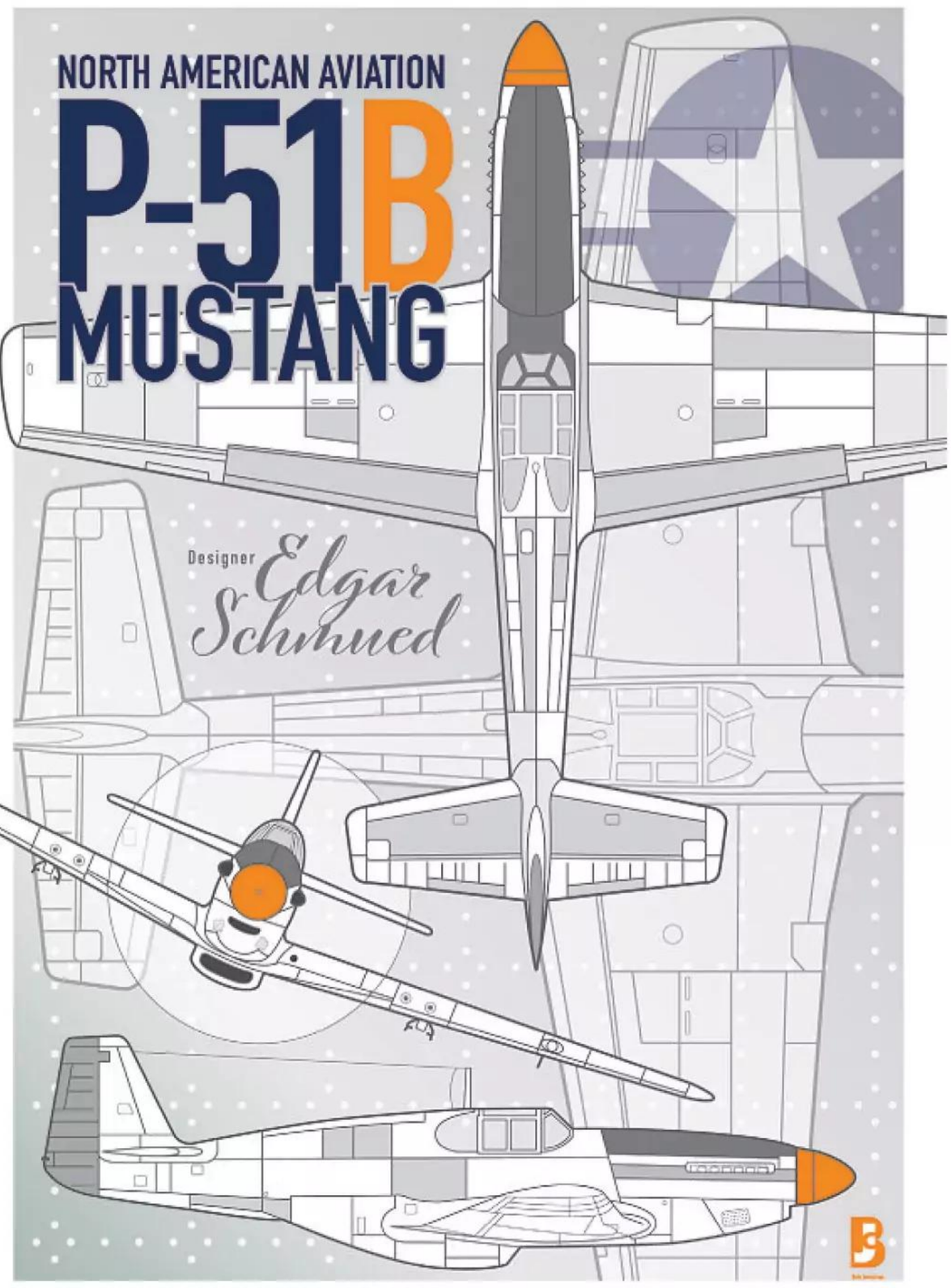
Bob went on to provide more information about his work:

"The PSSA work started with a proposal for T-shirts to mark the Skyhawk Mass Build event from Phil Cooke. I had taken part in the first Mass Build, for the Jet Provost, in 2014. Since then, I've made time to put graphic images together to commemorate various events and anniversaries throughout the flying seasons. We're coming up to the 40th anniversary of the PSSA in 2026 and a logo is underway.

Apart from my commercial design role in Medical Communications, designing and creating for my hobby is a lot of fun. If it can help a great cause, all the better. I put some proposals forward for Leek and Moorland Model Gliding Association, my local club to refresh the logo for a website upgrade. Not long after that, I entered the competition for the 2026 FAI Scale World Championships. I'm looking forward to seeing all the merchandise together at Buckminster.

The aviation prints were born off the poster for the Sabre Mass Build. I produced Mass Build posters for the PSSA members. I had the idea to go further, beyond the 'blueprint' design of an aircraft type and make it more of a graphic art piece with a suitable amount of relevant historical detail. The scope for subjects is endless and I will keep adding to the set as I can. I'm open to requests if there's a specific type that is needed."





Bob's winning logo for the 2026 Scale World Champs. Visit https://worldscale26.bmfa.uk for the latest information on this prestigious event.

The PSSA will be celebrating their 40th anniversary in 2026. Here's Bob's logo for the occasion.

SUPERMARINE SPITFIRE MK.IX

After flying XFly's prototype desert schemed model Kevin Crozier puts a production kit under the spotlight

Words **Kevin Crozier** Photos **Kevin Crozier, XFly-Model**

Regular readers will remember that in the last issue we introduced a pair of new and exciting models of the Supermarine Spitfire Mk.IX which will be hitting model shop shelves soon. Indeed, they may already be available by the time you read this article.

Developed by XFly-Model in collaboration with their UK distributor, CML Distribution, two versions are being offered with matte finish scale liveries, one being for MK392, the aircraft which Commonwealth ace 'Johnnie' Johnson flew during the Normandy landings, complete with invasion stripes. In this article I'll be taking a closer look at one of the first production kits of this famous fighter, our review model being of the D-Day type.

The other colour scheme, the subject of the prototype kit that we built and flew last month, displays the desert scheme of EN152, as flown by Neville Duke in Tunisia early in 1943.

The review model replicates MK392, the aircraft which 'Johnnie' Johnson flew during the Normandy landings, complete with invasion stripes.

The prototype kit that we built and flew last month displays the desert scheme of EN152, as flown by Neville Duke in Tunisia early in 1943.

With a 1200 mm wingspan and constructed using EPO foam the XFly Spitfire kits are supplied with a 4-blade propeller, an accurate canopy outline, pilot figure, exhaust stacks, cannons and outward retractable electric landing gear. The large battery hatch can accommodate a 4S 2600 - 4000 mAh 4S LiPo feeding a 3541-KV745 brushless motor via a 40A ESC. The model uses four panel split flaps, just like its full-size counterpart. Day-bright LED wingtip lights aid visibility and add realism. RRP of both models is £299.99

UNBOXING

After extracting the largely pre-finished model from its protective box, I have to say that I couldn't really detect any difference between the prototype and production versions. The first model came in a plain white box, whilst the second one showed the final artwork, depicting both colour choices, D-Day and Desert, side by side on a sky-blue background.

As with the prototype, the latest model was supplied in one of X-Fly's excellent closely moulded foam inner trays. This wraps snugly around the fuselage and one-piece wing, with additional pull-out pieces of moulded foam to provide additional protection and to keep all the airframe parts separate during transit.

> "I have to say that I couldn't really detect any difference between the prototype and production versions"

Copious sheets of a very thin packing foam are also used to protect the spray-painted finishes of each part.

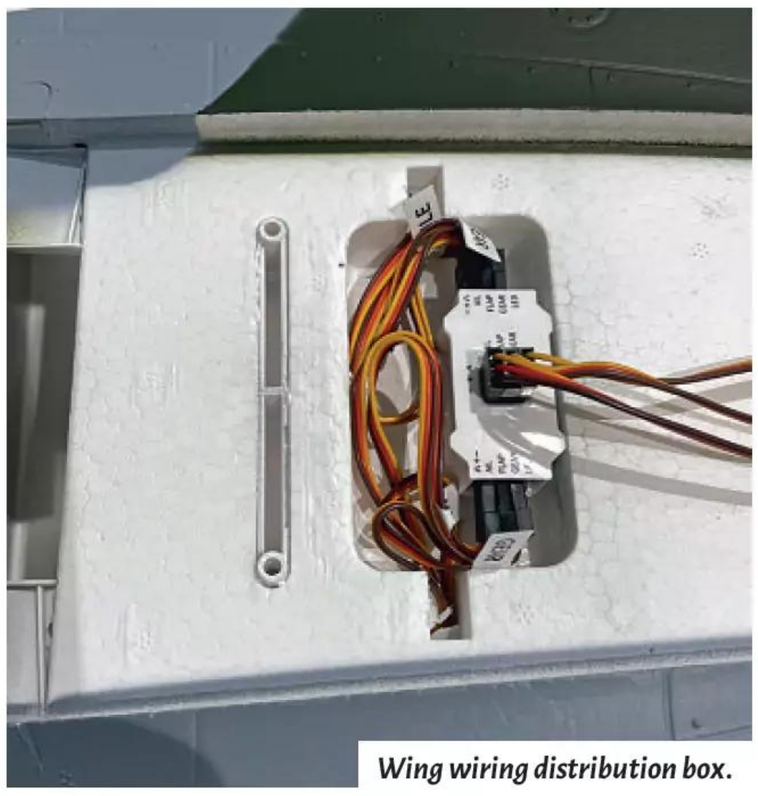
Having assembled numerous other XFly models I wasn't fazed by the absence of any instructions with the prototype kit, which were still being finalised. However, it was good to see a neatly presented 36-page manual, half English, half Chinese, supplied with the production kit. You'd be hard pressed to get this one wrong during its build!

CUPPA TIME!

You'd best put the kettle on and make a nice cup of tea before starting this model. You'll probably still be finishing it up after the bare bones of the Spitfire are put together, it's that quick and easy!

The one-piece wing, complete with ready fitted flaps and electric main undercarriage,

One-piece wing is fully finished, including split flaps and electric retracts.



Wing wiring distribution box.

The hinge at the left-hand end of the split flaps has popped out but was easily clipped back in place.

Look out for this box artwork when the Spitfire kits reach the model shop shelves.

Before powering up the servos for the first time it's wise to disconnect the flap linkages. But keep the loose pushrods clear of the wheel wells!

Cannons are a firm push fit and can be taken off if needs be for storage and transit to the flying field.

is simply bolted in place with four hex head countersunk screws. In the middle of the wing is a distribution box which brings together the aileron, flap, retract and wingtip nav lighting wiring and feeds it out of the wing centre section to three extension leads, separately labelled as Aileron, Flap and Gear, ready for connecting to the appropriate channels of your receiver. Take care to feed these wires down into the fuselage before nipping up the fixing screws as it's easy to trap a wandering wire between the wing and wing seat.

It's also worth taking a quick look at the flap hinges. These are of a snap together design and work really well, offering free and full movement. But I did notice on both models that one or two had popped apart during transit - see the nearby photo. Clicking them back in place is easy and I haven't noticed them come apart again after flying, but it might be something worth incorporating into your pre-flight checks each time you assemble the Spitfire at the flying field.

FLAPS & RETRACTS

Whilst on the subject of flaps, the inner box comes with a label to remind the builder to uncouple both flap linkages before powering up the servos for the first time in case they are over-driven and damage either the servo gears or the linkages. A sensible precaution, but I did this with the aeroplane upside down in a foam cradle, unclipping them from the ball-links at the flap end and rotating the linkages forward by 180 degrees so that they were well out of the way. What I hadn't spotted was that they were now perilously close to the edges of the wheel wells and when I tested the retracts (don't you just love flicking a gear switch!) one wheel refused to sit back down in its well. After a couple of cycles, I had a closer look and could see that one of the now reversed flap linkages was obstructing the recalcitrant wheel. It was only by a tiny amount but was enough to stop the wheel from retracting fully. The electric retract involved didn't complain so I'm guessing that they must be equipped with sensors that stop them if they come into contact with any obstruction. I believe that some retracts are fitted with over-current protection so will stop if the current suddenly ramps up. If so, it's a neat trick! With the linkage moved out of the way the wheel plopped neatly into its well after completing another cycle.

The retracts really look the part, complete with oleos, gear doors and realistic Spitfire style hubs. Best of all, they retract outwards, just like the full size. Long ago, I had a model Spitfire in which the wheels retracted inwards and whilst it looked the part when cleaned up and in the air, it was always the butt of jokes concerning its 'Hurricane legs' whenever it was flown. No such jibes can be levelled at this fine-looking rendition!

LEVELLING UP

The separate tail halves fit into plastic cuffs on either side of the fuselage at the base of the fin. Spitfire tails are often enlarged to improve their flying characteristics; I'm not sure if this has been done this time as the XFly version flies so well but if so, it's not noticeable.

The tail halves slide onto a carbon joiner and are retained with XFly's usual hex head

OTHER DEVELOPMENTS

Hot news from Jason Varley, MD of CML Distribution, XFly-Model's UK distributor, who collaborated with XFly to produce the new Supermarine Spitfire Mk.IX kits and who also backed this model with a large contribution to its costs:

"We have decided to add a couple of other options on top of the two Spitfires we have already.

We plan to offer a base white version for personal customisation. With so many potential Spitfire variants we are sure it will be attractive to some modellers (we sold quite a few of the airliner style jet from XFly in this format). It should be around £40 cheaper than a painted one.

We will also offer the current painted versions but without the retracts and landing gear. These will have 3D printed filled in doors. They will make good fun fighters for hand launching and belly landing. This should be around £50 less, but final prices for this and the unpainted version are to be confirmed."

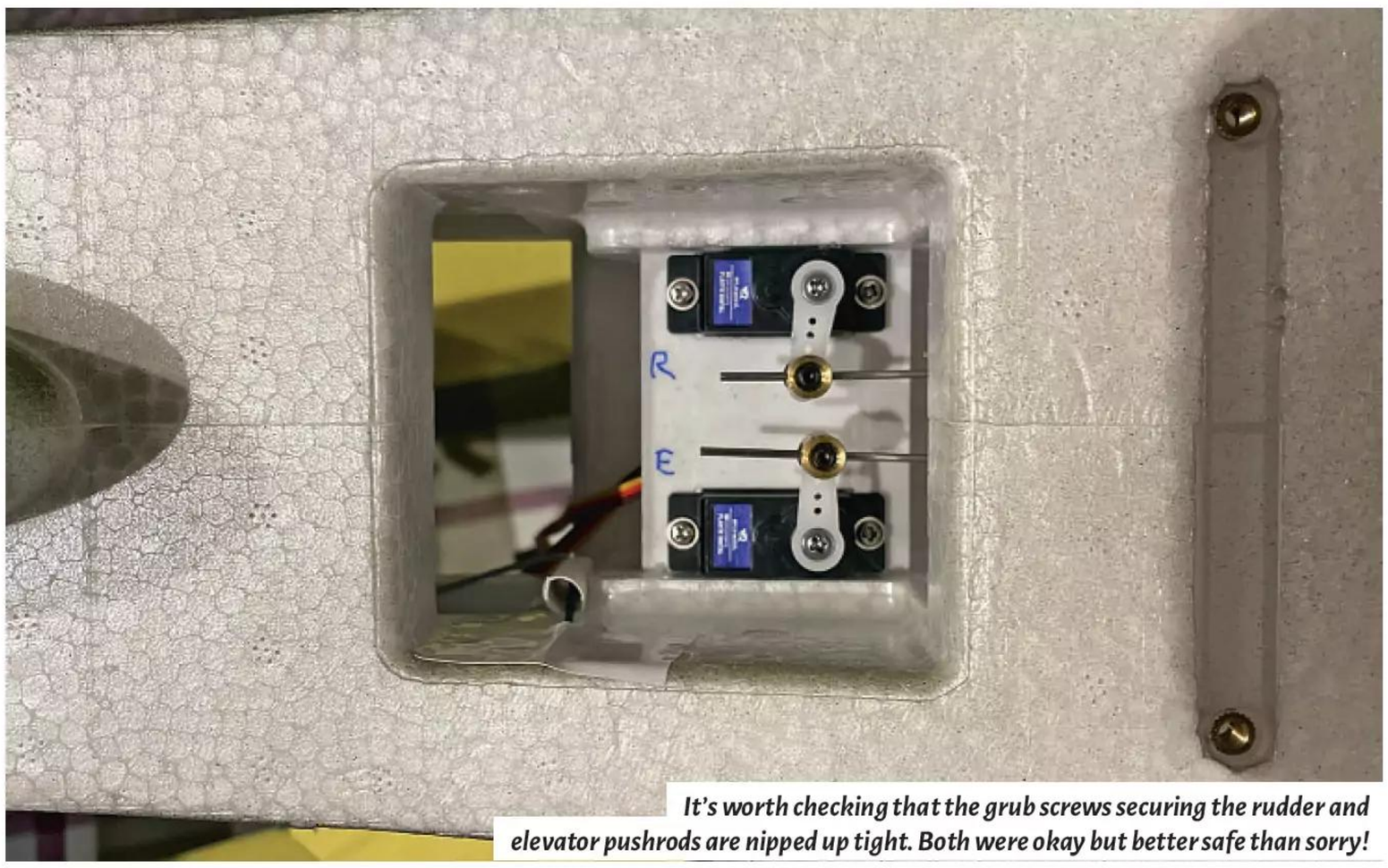
countersunk screws, two on each side. As I said in my previous report on the prototype model, I'm always a little concerned about this type of tail fixing as the mouldings need to be very accurate to ensure no horizontal mismatch between the wing and the tailplane, *"But in this case (the prototype), it was all spot on, so no packing at the tail was required."* Unfortunately, this was not the case with the D-Day model and the tail was slightly tilted when eyeballed from the rear against the trailing edges of the wing. This kind of error with ARTF kits is quite common but is usually only minor and can easily be rectified by inserting some thin strips of card (a business card is ideal) inside the edges of each cuff to drop the high side of the tailplane and to raise the low hanging side.

With that done the Spitfire is complete and just needs setting up. So, finish your tea and grab your transmitter!

All the control surfaces were well set up, requiring only minimal adjustments.

SETTING UP

When setting up the prototype, without the benefit of any instructions, I relied on advice on control throws and CG location passed onto me from XFly via their distributor CML. I was stymied by their suggestions of throws in percentages, so I resorted to using my own experience to guesstimate three levels of rates, selected by a single Flight Mode switch on the right shoulder of my Tx. With the production kits, however, the recommended control throws are clearly shown. They are still shown as percentages (!) but, thankfully, also in millimetres - phew! It was interesting to see, when I checked the prototype, that my guesstimates for aileron, elevator and flap high and low rates were close to those shown in the instructions. Since I was more than happy with how the prototype performed, I simply copied my settings across.



It's worth checking that the grub screws securing the rudder and elevator pushrods are nipped up tight. Both were okay but better safe than sorry!

XFly-Model also recommended a CG location at 65 mm back from the leading edges at the wing roots and this has been maintained in the instructions. Following my flights with the prototype model, including one sortie at a more rearward setting (soon abandoned!), I can confirm that in my opinion XFly have got the CG for their Spitfire spot on! The only issue I have with this is that when tested with all the 4S LiPo packs available to me from within the suggested 2600 - 4000 mAh range, all required the addition of nose weight to reach the suggested CG point. I eventually settled on using a 4S 3200 mAh LiPo with a 70-gram strip of lead flashing secured on top. It seems a bit of a waste though to be lugging around bits of lead when there's plenty of room for a bigger pack. To that end I asked CML to send over one of their slightly heavier Voltz 4S 4200 mAh LiPo packs and that is ideal, allowing the Spitfire to balance at the recommended balance point without carrying any unnecessary nose weight. The only problem is that this pack is only

I'll be trying this larger Voltz 4S LiPo when test flying the new Spitfire. It's the perfect weight to avoid needing to add any lead in the nose!

Will this damp and dreary weather ever end! Prototype 'Desert' Spitfire sits at the end of Chedworth's foggy runway.

We can't wait for blue skies and warmer weather so we can fly the new XFly-Model Spitfires in brighter conditions.

"…the instructions recommend that a small amount of down elevator be mixed in when the landing gear is retracted"

available with a Deans connector, whereas the ESC is fitted with an XT60 plug. A short Deans to XT adapter lead soon sorts that out, though!

To control this model, I used one of Futaba's excellent 6-channel R3006SB receivers which I mounted at the back of the battery bay using self-adhesive hook and loop tape. These kits come with a decent length of this material, the bulk of which was used to hold the LiPo in place. An additional pair of hook & loop straps, with buckles, are also pre-fitted to keep the battery secure.

ELEVATOR MIX

When I flew the desert Spitfire, I was careful to look for any change of trim when lowering the flaps and cycling the undercarriage. I can't say that I noticed any major effects but it's interesting to note that the instructions recommend that a small amount of down elevator be mixed in when the landing gear is retracted. I have set this up using a mix that is initiated by flicking the gear switch.

WAITING GAME

With the X-Fly-Model Spitfire Mk.IX (D-Day scheme) fully finished the wait for decent flying conditions has begun. At the time of writing the winter weather is alternating between calm but dreary (or dreich as our Scottish readers would say. A very apt description!) or howling wind and rain, neither of which is which is any good for taking flying pictures of review models! So, I will have to ask you to sit tight for a while longer and I'll bring you up to date with how the 'Johnnie Johnson' Spitfire flies as soon as I can. However, if, as likely, it shares the same smooth flying attributes as its sand-coloured sibling (see last issue) then I'll be more than happy. It will be worth the wait!

DATAFILE

Model:	Supermarine Spitfire Mk.IX
Model type:	ARTF warbird
Manufactured by:	XFly-Model
Distributor:	CML Distribution https://www.cmldistribution.co.uk
RRP:	£299.99
Length:	1010 mm (39.8")
Wingspan:	1016 mm (40")
Flying weight:	1350 g (review model 1790 g)
Motor:	3541-KV745
ESC:	40A
Prop size:	11" x 7" 4-blade
Servos:	9 g x 6
Functions (servos):	Ailerons (2), Elevator (1), Flaps (2), Rudder (1), ESC, Electric retracts
LiPo:	4S 2600 - 4000 mAh (review model Voltz 4S 4200 mAh)

In the meantime, we have used some pictures supplied by XFly-Model of a D-Day variant in flight to illustrate this article. Our fingers are crossed for blue skies like these ones! ■

Peeling away to give a clear view of the invasion stripes.

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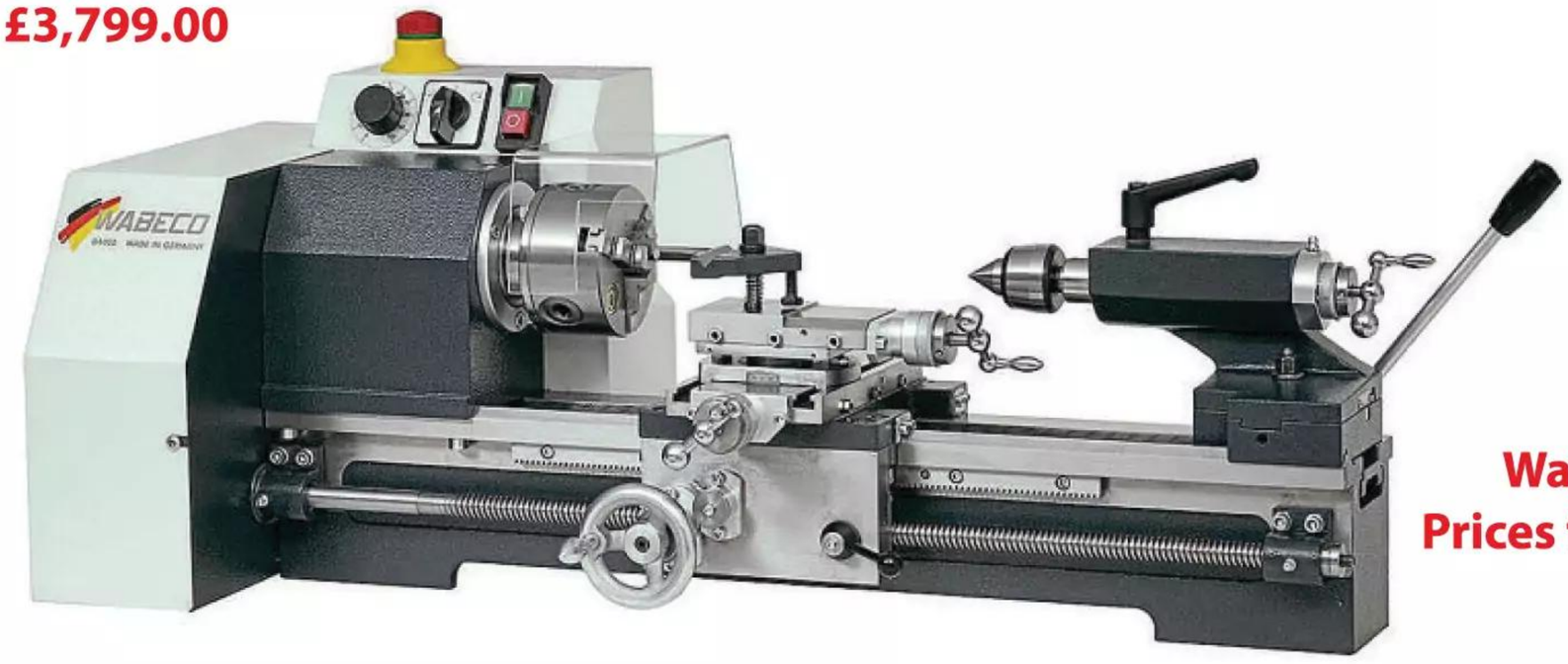

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AVRO 707

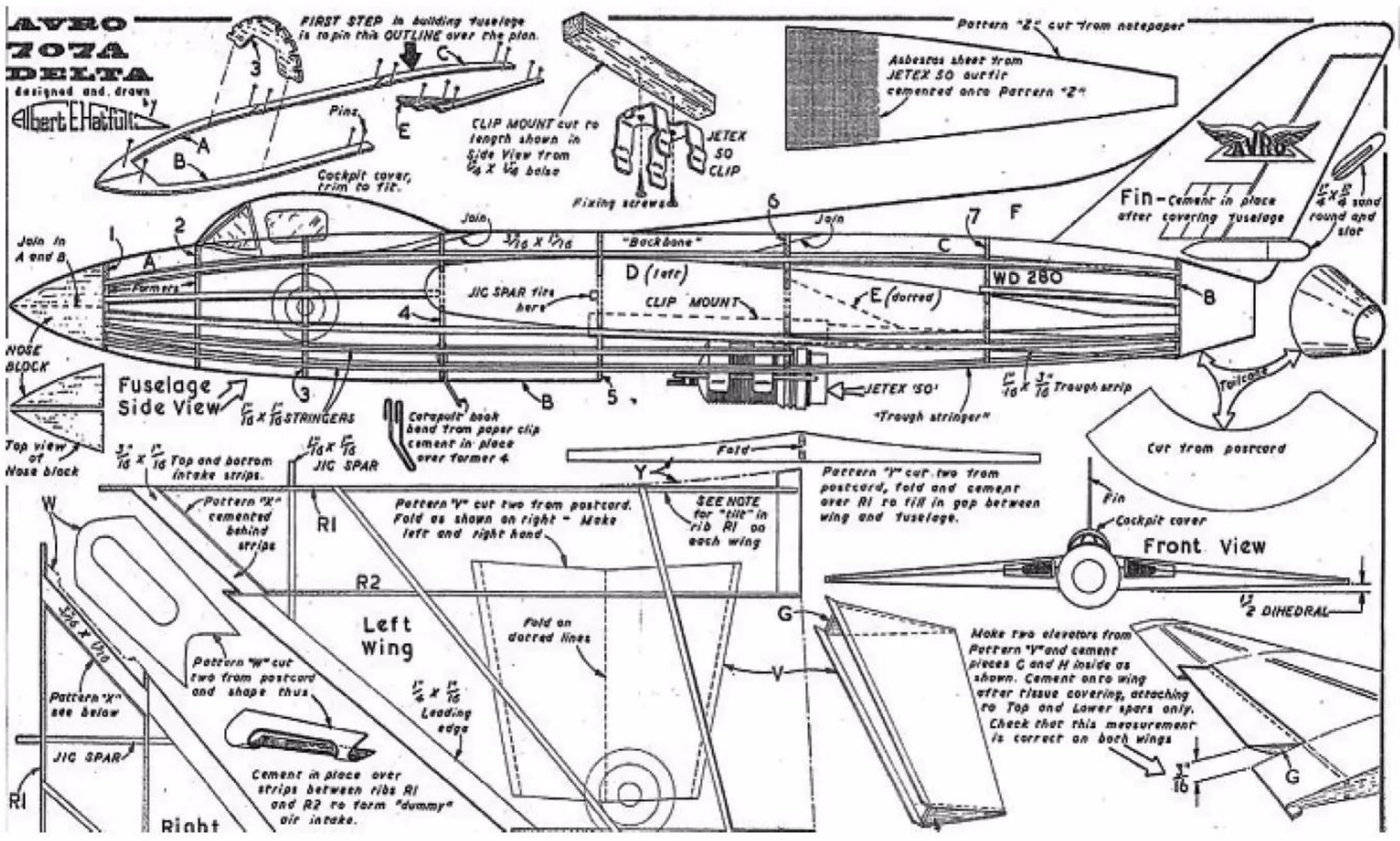
Mike Roach relates how a Keil Kraft favourite went from Jetex to EDF - in 66 years!

Words & photos **Mike Roach**

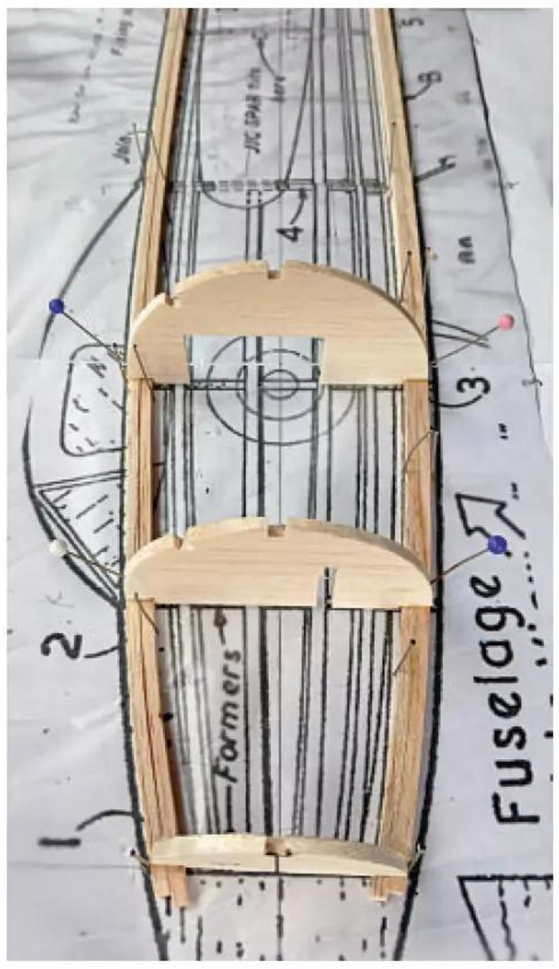
My first adventure with an EDF (Electric Ducted Fan) model came to a frustrating and embarrassing end when my brain and thumbs simply refused to catch up with the little Arrows Hawk that I had bought myself as a birthday present. After three increasingly awful crashes I excavated the hardware out of the wreckage and put it all on a shelf, well out of sight.

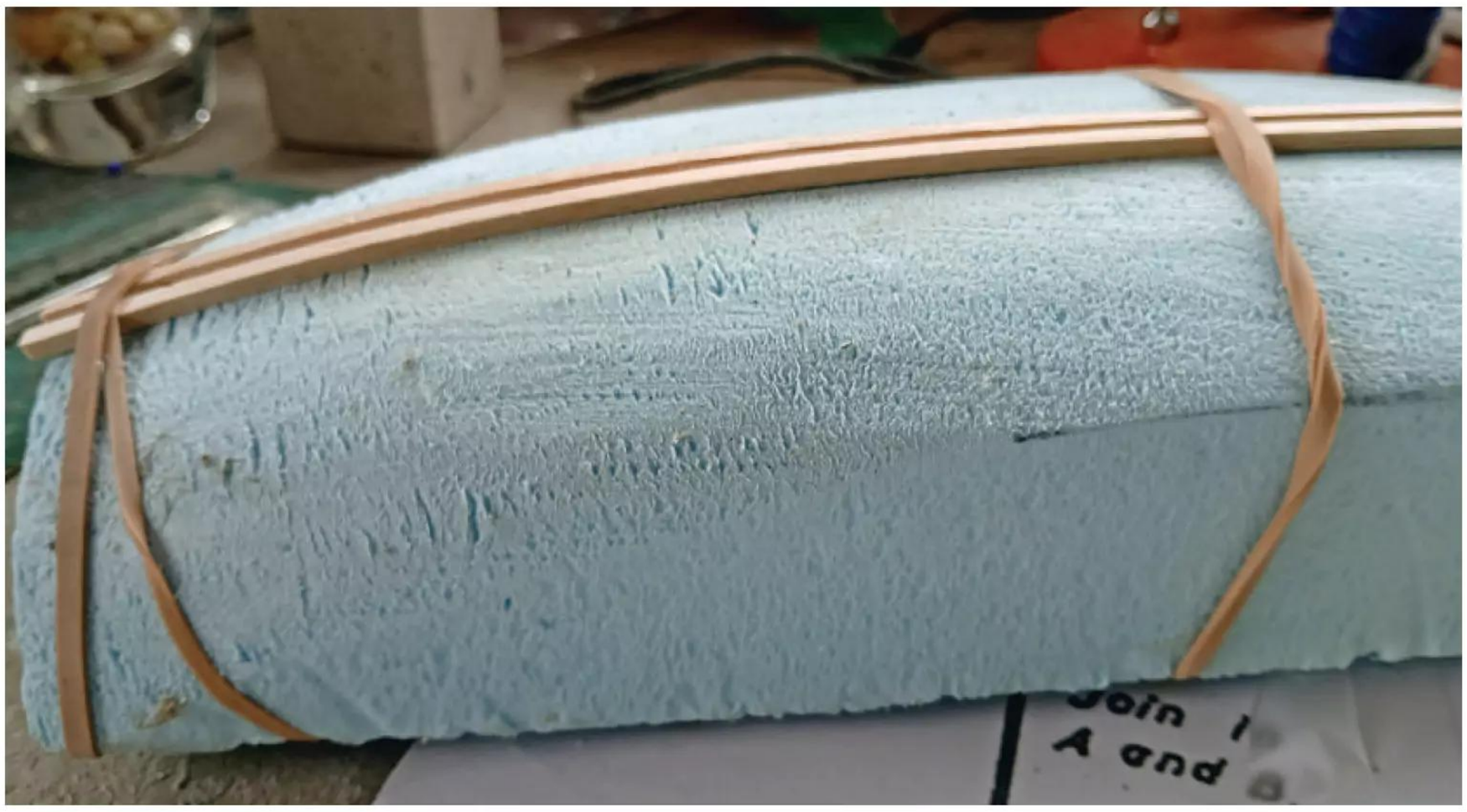
A couple of months later I was talking to a friend about the Keil Kraft and Veron models we had built as kids. My favourite was the Avro 707. We had a long garden in the 1950s and it made perfect sense to treat it as a glider. But the inevitable transition to a Jetex version resulted, as they all seemed to do, in a fire.

A browse online found the plan that I remembered so fondly. The original model has a span of 13.5" and the 50 mm fan from the Hawk would easily fit in a twice-size version. And with much more wing area it would surely fly slowly enough for my old head to follow - wouldn't it?

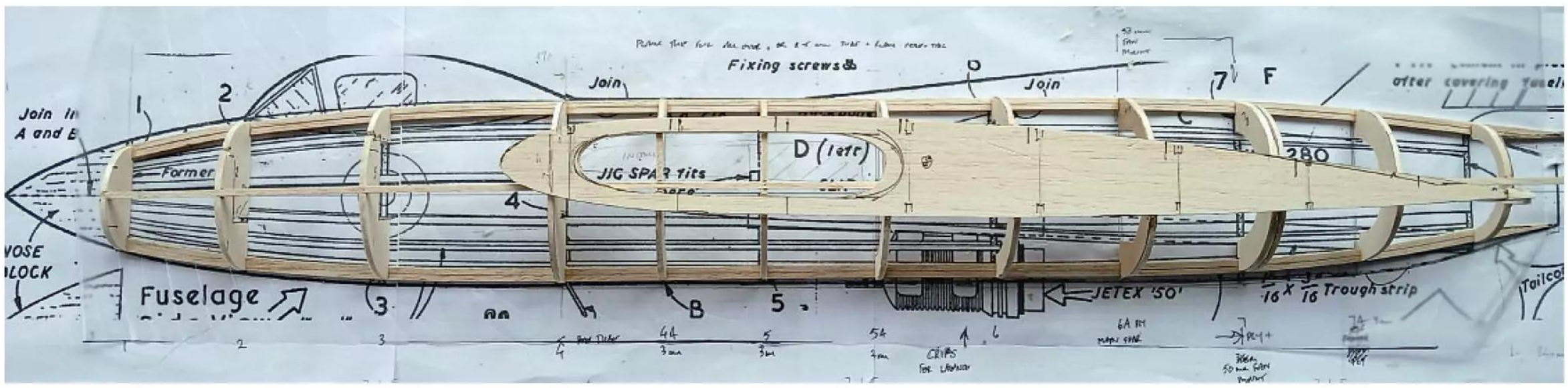


Avro 707 plan was easy to find online. The sheet parts are included and are remarkably accurate, even when enlarged.

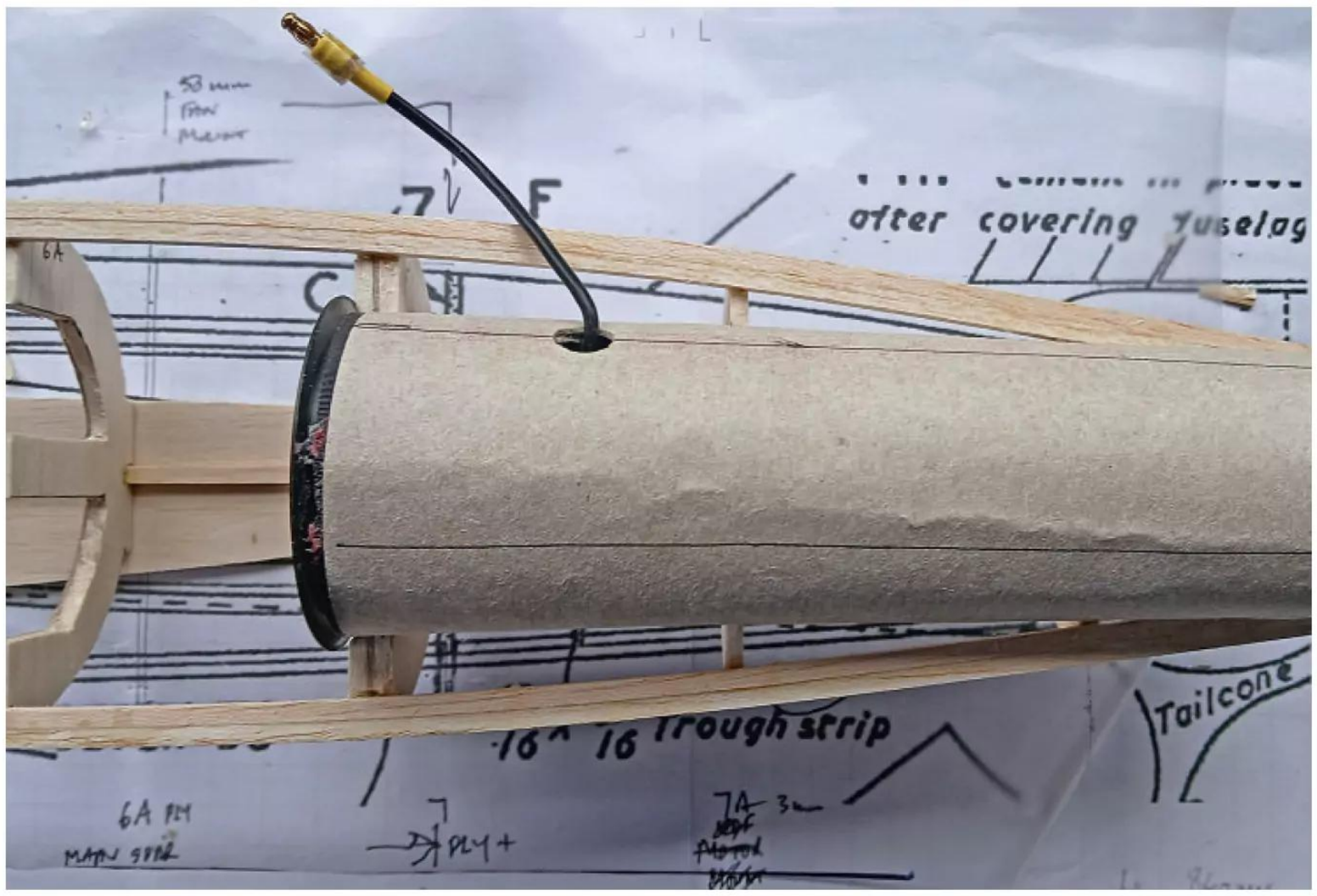




I made the longerons from two layers of 3 mm square strip, wetted and pre-curved over a foam form to take out any stresses.



The wing root is pretty much to scale and holds the half-fuselage in place. The large hole is to allow air to the fan. The CG marking is from the plan and is just about perfect.



The efflux was made from thin card, recycled from a breakfast cereal packet.

The plan even shows the parts that we used to cut out with a broken razor blade. (Actually, that's a lie. I had a proper knife and never cut a finger off!)

DELTA BUILD

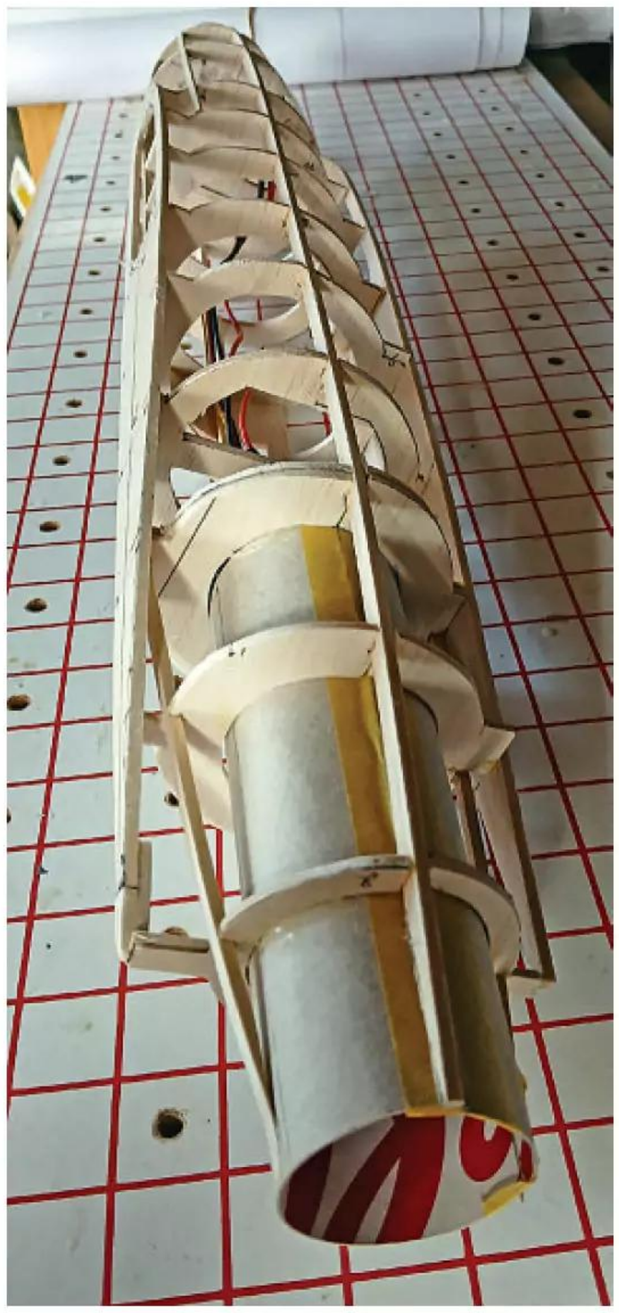
I built the fuselage and wing roots pretty much according to the plan, adding in extra formers and putting the fan and efflux where my EDF pals suggested. Making the efflux from corn flake packet cardboard was simple and light - I recommend it. The parts from the printed list were modified by reducing the former diameters by 2 mm to allow for the planking, otherwise my childhood hero, Albert E. Hatfull, had done an excellent job of designing this and the other KK Scale Series models.

All the hardware from the Hawk - the fan, ESC and my receiver - were plumbed in and a balsa battery plate added, but far too far forward as it turned out! Most of the 2.5 mm soft balsa planking - three whole sheets of 3" x 36" soft - was satisfyingly glued in place, leaving enough access for the wing servo wires to be fed into the Rx.

The wing needed a complete structural redesign along traditional lines. I added a CF tube as the main spar and a smaller rod for the incidence peg, but I could not face all the packing and jigging needed to get the symmetrical section ribs to line up. The simplest solution was to cut them in half along the chord and build the lower half first, adding the locations for the spar and peg, gluing the lower D box, aileron spar, cap strips and servo plates in place as I went. With the half wing off the board the upper ribs and then the rest of the balsa was easy enough to add.

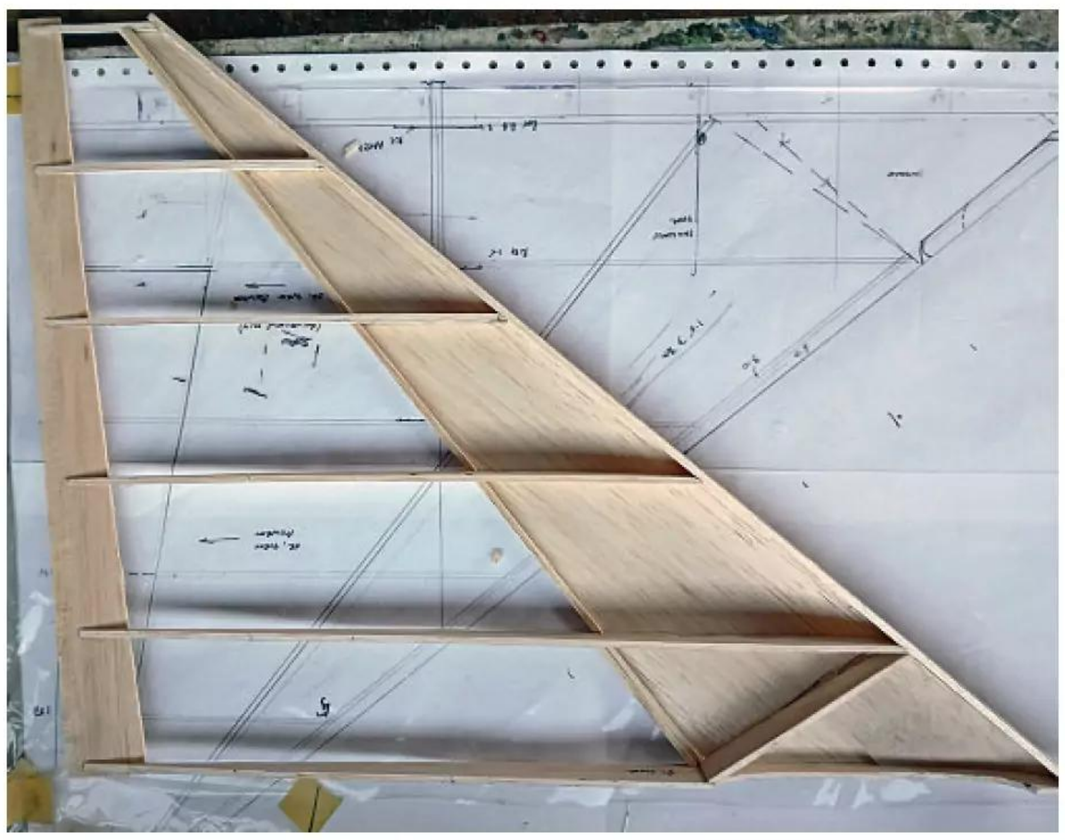
The lovely swept fin and rudder were copied from the plan using 3 mm medium balsa and shaped to fit accurately over the fuselage longeron. I cut out the rudder it to 'make it look more real'. Rather than 'glue in place after covering', I added thin ply edges which slotted into the fuselage to make a firm joint. It's a hand launch model, using a grip section in the lower fuselage, which acts as an added air intake as a bonus.

The Jetex version has thin card elevators

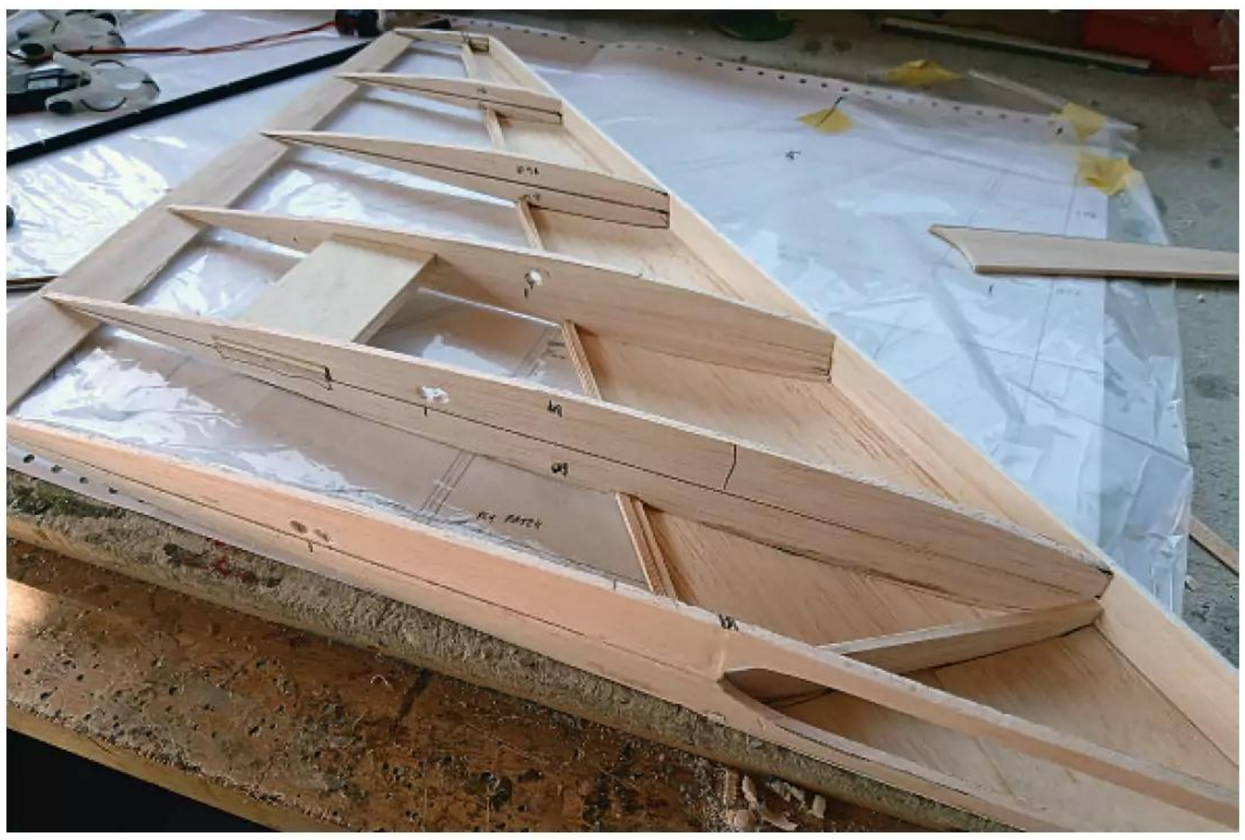


Completed halves ready for planking.

Wing is a complete redesign using the plan sections but adding a D-box, 3 mm strip spars and a CF tube joiner. This is the lower half.



Upper rib sections and the air deflector added.



Fit the upper spar then close the D-box. Repeat for the other wing.

Checking the fit of the lovely fin along the longeron.

added after covering, with 3/16" reflex built in. The real thing had ailerons and elevators along the trailing edge of the delta, with flaps well inboard. But I simply made built-up elevons to save the weight of extra servos. A mix on the transmitter, with the servo leads plugged into ports two and three on the Rx gave the required response.

SEEING RED

I glassed the fuselage lower half using a water-based varnish, then glued the wings in place, testing the radio connections before it was too late. Covering was with 'Bright Red' film from George at 4-Max. The generic bubble canopy came from Steve at Vortex Vacforms and the markings from Calliegraphics. The difference that adding scale markings makes to a model is always incredibly satisfying, as well as taking the eye off the obvious slight wrinkles.

Putting everything together is a great opportunity to see what needs to be done before it's all nailed into place. This is, of course, a one-piece model.

One of the 10mm soft balsa leading edges in place with a first go at cutting out the air intake.

With everything in place, covering the model with 'Bright Red' film was very satisfying. The fin was covered separately and slotted into place after the fuselage was finished. The tape marks the CG position.

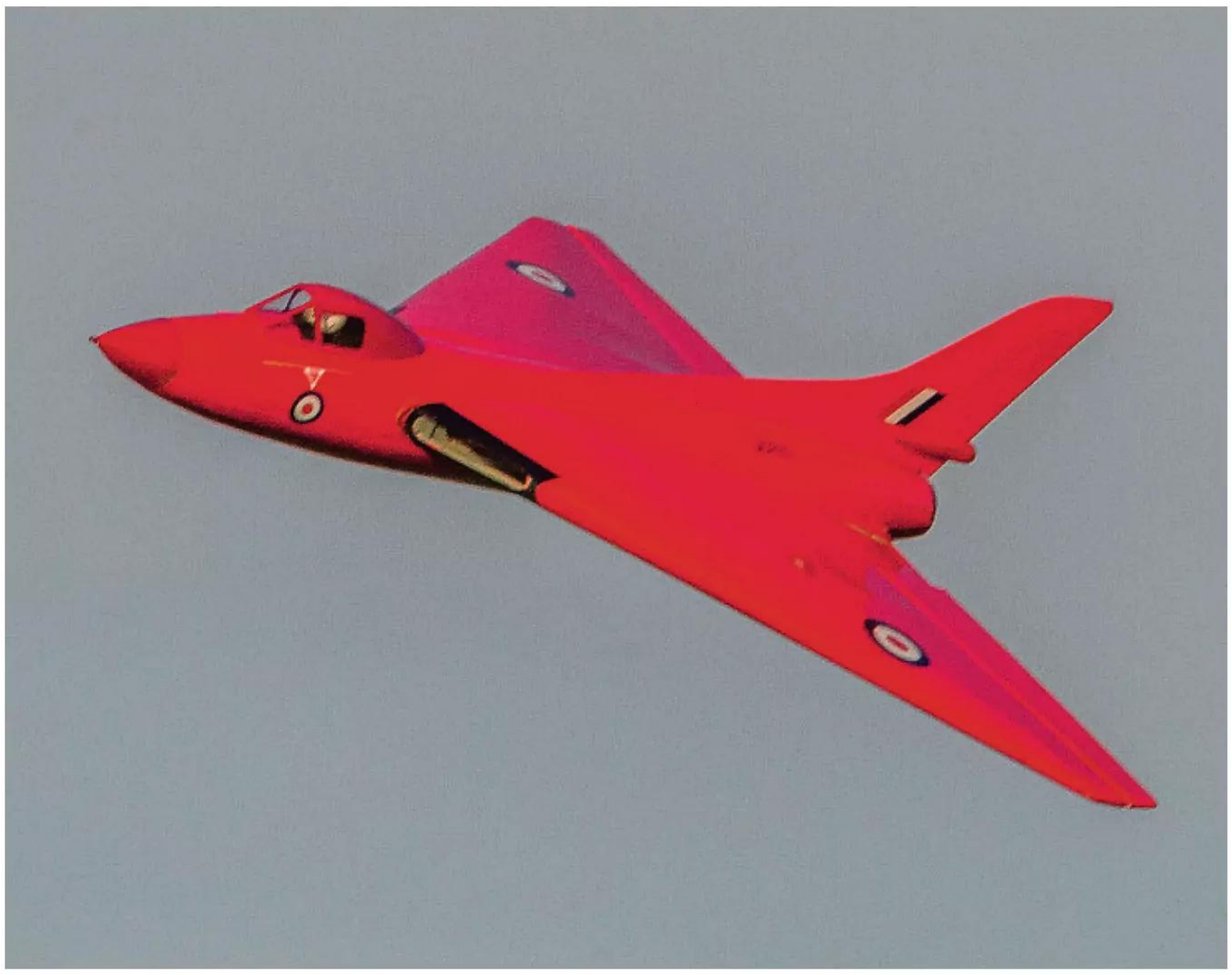
I could not find a red paint to match the very bright red film; even the scanner at Homebase failed. This explains the darker red nose cone and cockpit.

UP AND AWAY!

Finally ready to fly, would the fan be powerful enough? And would the model fly as well as my original version did when I was 13 years old? The Arrows Hawk weighs about a pound, but my 707 weighs eight ounces more. It was time to find out!

A brisk hand launch at full throttle and she settled gracefully onto the grass. Another try

The first attempt was under elevated, but a few more millimetres of reflex gave a secure easy hand launch at full throttle.



The addition of markings instantly make it into a 'proper' model. The black covers on the intakes are made from very thin Depron and help keep the rather fragile balsa edges neat and secure.

with more up trim and, yes, she flies! Following a gentle circuit, still climbing, I eased off the elevator trim and gradually a fast jet came to life - but not so fast that I lost track of it! After a four-minute flight on a 3S 2200 LiPo the glide into land seemed to go on and on and made me a very happy old fella.

In conclusion, the CG is an inch or so too far forward; it's my design fault and can't be changed for this model. A 3S 1300 puts it in the right place but results in the loss of flight time.

MORE OPTIONS

The Keil Kraft Jetex series has one more tailless delta, the Douglas Skyray, but the Javelin (for two 50s?) is in the same mould. Slightly less easy to convert, but very attractive shapes, are the Hunter, Swift, Attacker, Panther and many more.

The Veron range is smaller but includes some larger plans, originally for IC ducted fan. All plans are available on the internet; just search by manufacturer.

The Avro 707 has no fewer than four shape options and numerous colour schemes. A 64 mm fan and a 4S LiPo would give far more performance than I feel happy with.

I had great fun making this model and sorting out the very few problems in its design. Have a go! ■

The Keil Kraft model has the standard wing root intakes. Other colour options are yellow, pink and orange, all easily achievable with modern heat shrink film.

THE REAL THING

A series of one third scale prototypes were built to assess the low-speed characteristics of the delta wing for the Avro Vulcan. The 707 came in four shapes and several colour schemes which can be explored using your favourite search engine. There was a well-publicised Farnborough flypast with two white Vulcans and four 707s in red, white and blue.

707B - Short nose, VX784. The first to fly, with the air intake behind the cockpit. Natural metal, it crashed during testing.

707B - Long nose, VX790. A similar aircraft but with a much more attractive longer nose that became the standard for the series. Natural metal and then blue.

707A - Straight wing, WD280. The Keil Kraft model with the now standard wing root intakes. A mere four colour options: yellow, pink, orange and bright red.

707A - Kinked wing, WD280. The 'kinked' Vulcan wing was tested on the A series aircraft. All white.

707C - The only two-seat version, WZ744, must have been very cramped. Natural metal with a black anti-dazzle patch.

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Howard DGA-3 "Pete"

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Illustration of the Classic Dolphin soon to be updated by MVM

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JPS-3 RACER

Kevin Crozier quickens his pulse by flying a 40-inch electric pylon racer

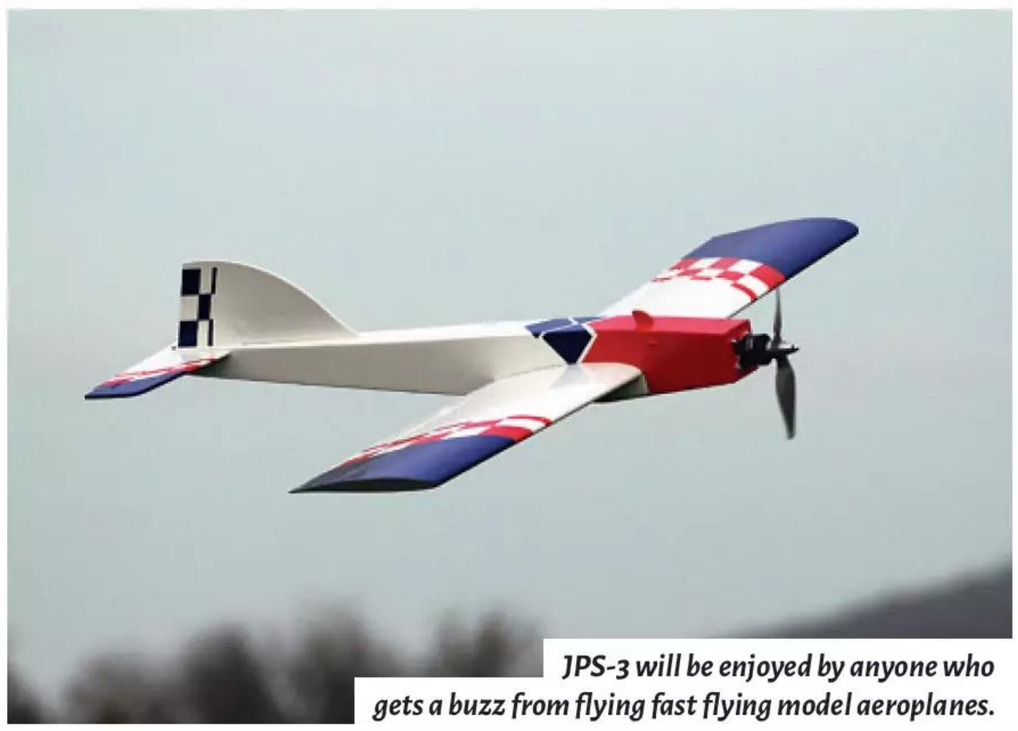
Words **Kevin Crozier** Photos **Kevin Crozier, Barry Atkinson**

Early in my R/C model flying career I had a few fast aeroplanes. A couple that stood out were a Flair Dara pylon racer and a Ken Stokes Mirus. Both were mighty fast, even when powered by stock second-hand .20 and .40 glow engines, and the thrill of flying them has always stuck in my mind. But as time went on my interests went in other (slower!) directions.

Fast forward to a couple of years ago when I joined a local club where some members were actively involved in electric pylon racing. My visits only coincided with them flying their zippy little models on a couple of occasions, but they did look fun to fly. Not long after I was pleased to see one of the double page spreads taken out by J. Perkins at the front of RCM&E extolling the virtues of their new JPS-3 E2K pylon racer. This easy to build ARTF model, with its sporty graphics and simple box fuselage, looked just the thing to enable me to join in with my 'bank & yank' clubmates. So, I ordered a kit, plus the E2K race approved hardware to go with it.

RACING HERITAGE

E2K is recognised as an entry class into pylon racing. Races are run on a short course over 10 laps of 270 metres each. The models use a race approved



JPS-3 will be enjoyed by anyone who gets a buzz from flying fast flying model aeroplanes.

Recommended powertrain consists of a Radient E2K Race brushless motor and a ZTW Beatles 80A ESC, powered by a Radient 4S 2200mAh 50C LiPo.

budget outrunner motor and a standard 4S 2200 mAh LiPo. ESCs are programmed to provide the same maximum RPM so that racing is more dependent upon pilot skill than being able to afford and set up more specialised equipment.

The JPS-3 has an impressive racing heritage having been designed by pylon racing champion Paul Bardoe. Paul was victorious with the original versions of the JPS-3, taking top spot at the 2022 E2K Pylon Race Championships, held as part of the BMFA Power Nationals.

Of course, you don't have to race with it and there's nothing to stop you flying this neat 40" span hand-launched aeroplane as a club sport model. Even at lower power settings my model has proven to be very agile and capable of all the usual club style aerobatics – at least those not requiring a rudder!

RACING SET UP

With the possibility of using my model for some pylon racing in the future, even if just for training with some of the E2K enthusiasts at my local club, I decided to invest in the recommended powertrain. This consists of a Radient E2K Race brushless motor and a ZTW Beatles 80A brushless ESC, powered by a Radient 4S 2200mAh 50C LiPo.

As for the propeller, an APC 8" x 8" is recommended for hardcore pylon racing. However, for sport flying an APC-E 8" x 8" can be used instead. I purchased both props with the intention of using the electric version for test flights before moving on to the full racing spec blades.

As for servos, I chose the 'Goldilocks' priced option, in between the recommended Futaba

From the middle of the recommended servo list, these Hitec HS-85MG units have proven to be a good match.

S3150 and Radient RS-M125-MG units, this being Hitec's HS-85MG. Three are required for the two ailerons and elevator, there being no rudder.

OPEN THE BOX

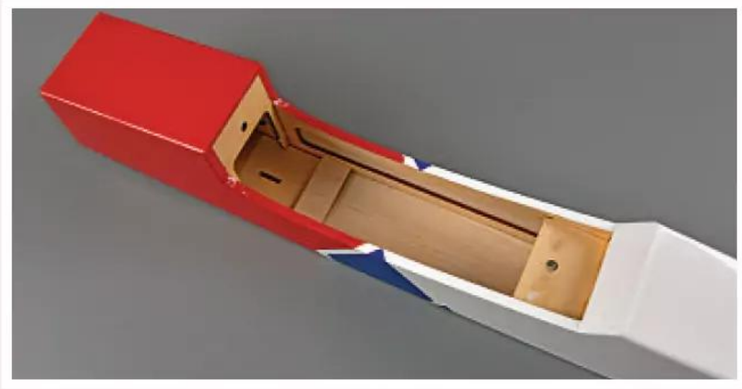
Open the box, with its attractive label on top, and you'll find a largely pre-built and ready covered airframe. There's no foam in here unless you count the polystyrene cores within the veneered foam wing panels.

The model is expertly covered in white heat-shrink Oracover with blue wing and tail tips, finished off with red chequerboard stripes alongside.

Accessories include parts for a trad elevator pushrod (albeit using carbon rod), ply wing braces, servo mounting blocks and old school nylon control horns - more on those in a bit!

Finally, having built a couple of far more expensive models recently, both of which

Box contents, all excellent quality. The airframe is professionally finished in Oracover.



Fuselage is of all wood construction, as seen from the underside of the wing bay.

I haven't seen one of these in a while! Foam cored wings are a perfect choice for this type of model.

lacked any instructions to aid their completion, I was pleased to see that the JPS-3 comes with a well written 8-page manual, complete with step-by-step instructions and clear photographs.

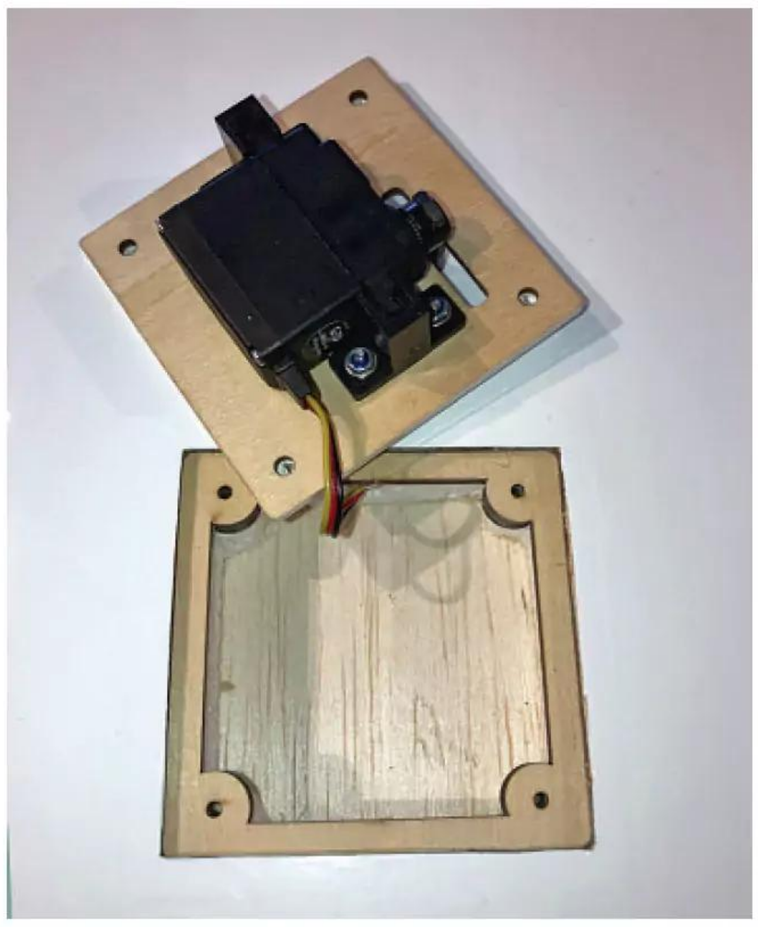
QUICK BUILD

Assembly starts by gluing the Mylar hinges into pre-cut slots in the ailerons and elevator, then matching them up with similar slots in the trailing edges of the wings and tail. The hinges are slotted ready for careful application of cyano which will quickly wick down into the balsa and hold them in place.

After test fitting the dihedral braces in each wing root, sanding off any sharp edges that hindered a smooth fit, the wing panels were joined. I used 30-minute epoxy, wiping off any excess with a tissue moistened with acetone. Take care if doing this to not let any solvent enter the joint. If in doubt just use white glue instead.

The instructions also mention the possibility of raising the survivability of the airframe (or the wing, at least!) if used for full on pylon racing by fitting a wing bandage (not supplied). If you do this then care needs to be taken not to impede the fitting of the wing to the fuselage and belly pan.

Aileron servos are held in place using pre-cut mounting blocks glued to the underside of the servo hatches. After mounting the servos



Aileron servos are fixed to the undersides of the servo hatches. I used the Hitec mounts instead of the mounting blocks supplied.

DATAFILE

Model:	JPS-3 Racer
Model type:	E2K pylon racer
Manufactured:	J. Perkins https://www.jperkins.com
RRP:	£159.99
Length:	737 mm (29")
Wingspan:	1016 mm (40")
Weight:	1022 g (review model 1003 g)
Rec. Motor:	Radient E2K Race 3536, 1500 kV
Rec. ESC:	ZTW Beatles 80A
Prop size:	APC 8" x 8" (racing), APC-E 8" x 8" (sport)
Servos:	Hitec HS-85MG
Functions (servos):	Ailerons (2), Elevator (1), ESC
LiPo:	4S 2200 mAh 50C

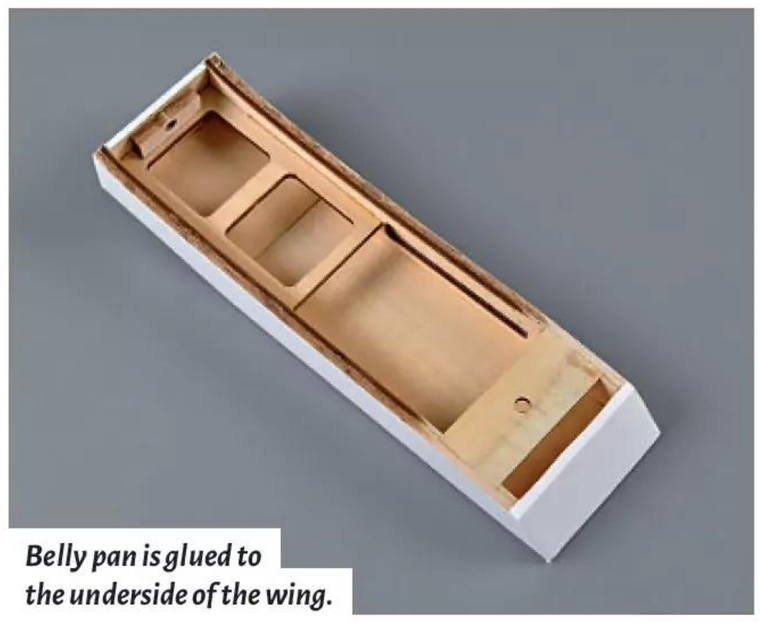
the hatches are dropped over the servo wells and fixed with four small screws. However, the Hitec servos that I used each came with a pair of plastic mounts, so I used them instead. The only drawback is that each mount needs to be held by another pair of small screws so when the servo hatch is screwed down you see eight small screwheads instead of just the four in each corner.

Each aileron is hooked up with a short piano wire pushrod, with a Z-bend at the servo end and a sprung clevis at the control horn. These are simple to make up, following the instructions, especially relating to their length. But it does help to have a pair of Z-bend pliers to hand; you can bend the wire using pliers, but the proper tool makes life much easier and it will come in very handy for other models.

NYLON HORNS

Now for my only real gripe with this model. It uses old fashioned bolt-on nylon control horns.

I've built many models in recent years and I can't remember the last time I had to fumble



Belly pan is glued to the underside of the wing.

around with these throwbacks to the last century. These days I'm more used to simply gluing a laser cut epoxy sheet horn into a tight-fitting slot in a control surface.

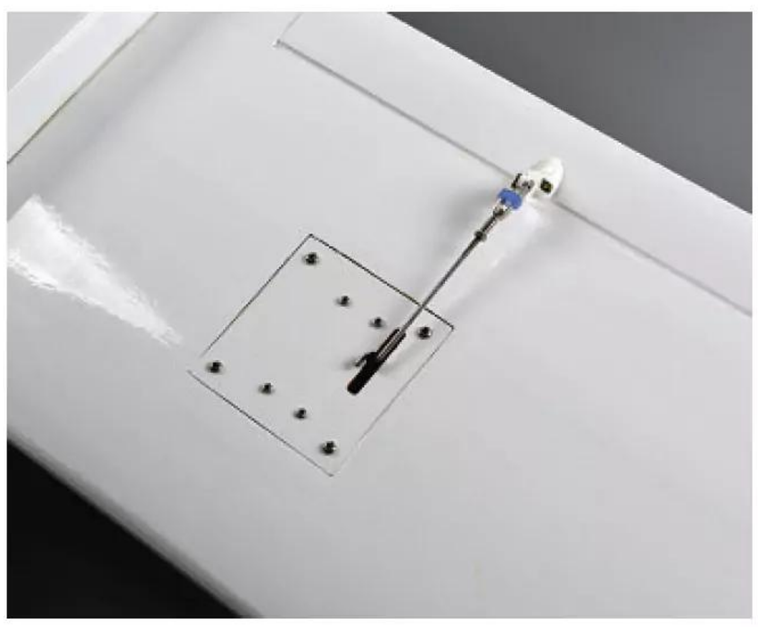
Anyway, I used the horns supplied but I did lose a couple of the fiddly retaining nuts in the process, resulting in the need to scour my spares bins for replacements, only to find said tiddly fixtures after I had finished the model. Grrr!

WING & TAIL FIT

With the wing complete it can be lined up and secured to the fuselage with a long M4 nylon bolt. The built-up belly pan is then glued in place after carefully removing the film underneath to ensure a good glue bond twixt pan and wing lower surfaces.

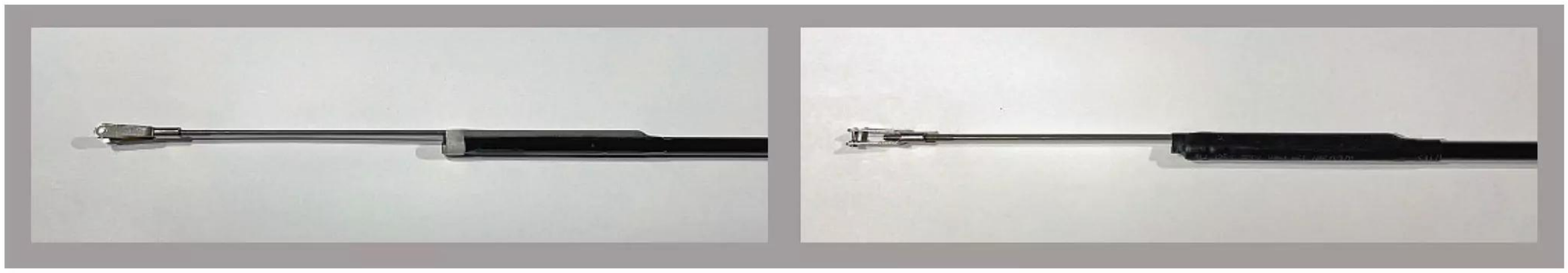
Whilst you are wielding a sharp hobby blade now's also a good time to remove the surplus film covering the gluing areas of the fin and tailplane. With that done they can be glued in place, making sure that everything is all square. When eyeballing the tailplane from the rear I could see that it was slightly tilted. But this was easily rectified by gluing some thin strips of card on the edges of the mount to drop the high side of the tail and to raise the low hanging side.

The carbon elevator pushrod can now be made up. The wire ends are held in place by 90-degree bends dropped into holes near the



Finished aileron servo installation. Pushrods are short and direct, with no slop.

The wing locates with a dowel at the front of the belly pan and is fixed with a single long M4 nylon bolt through the hole at the rear.



Carbon elevator pushrod is easy to make up if you follow the instructions. A skim of epoxy holds the wires parallel before heat shrink tubing holds them firmly in place.

A Dremel cutting disk was used to trim the unused shaft from the rear of the motor. An easy job with the correct tool!

Recommended Radient motor is supplied with an X-mount that lines up perfectly with mounting holes in the firewall. Ignore the exaggerated thrust lines which have been distorted by my phone's camera!

ends of the rod. A skim of epoxy holds the wires in place against the rod and when dry both ends are secured using heatsink tubing. Simple!

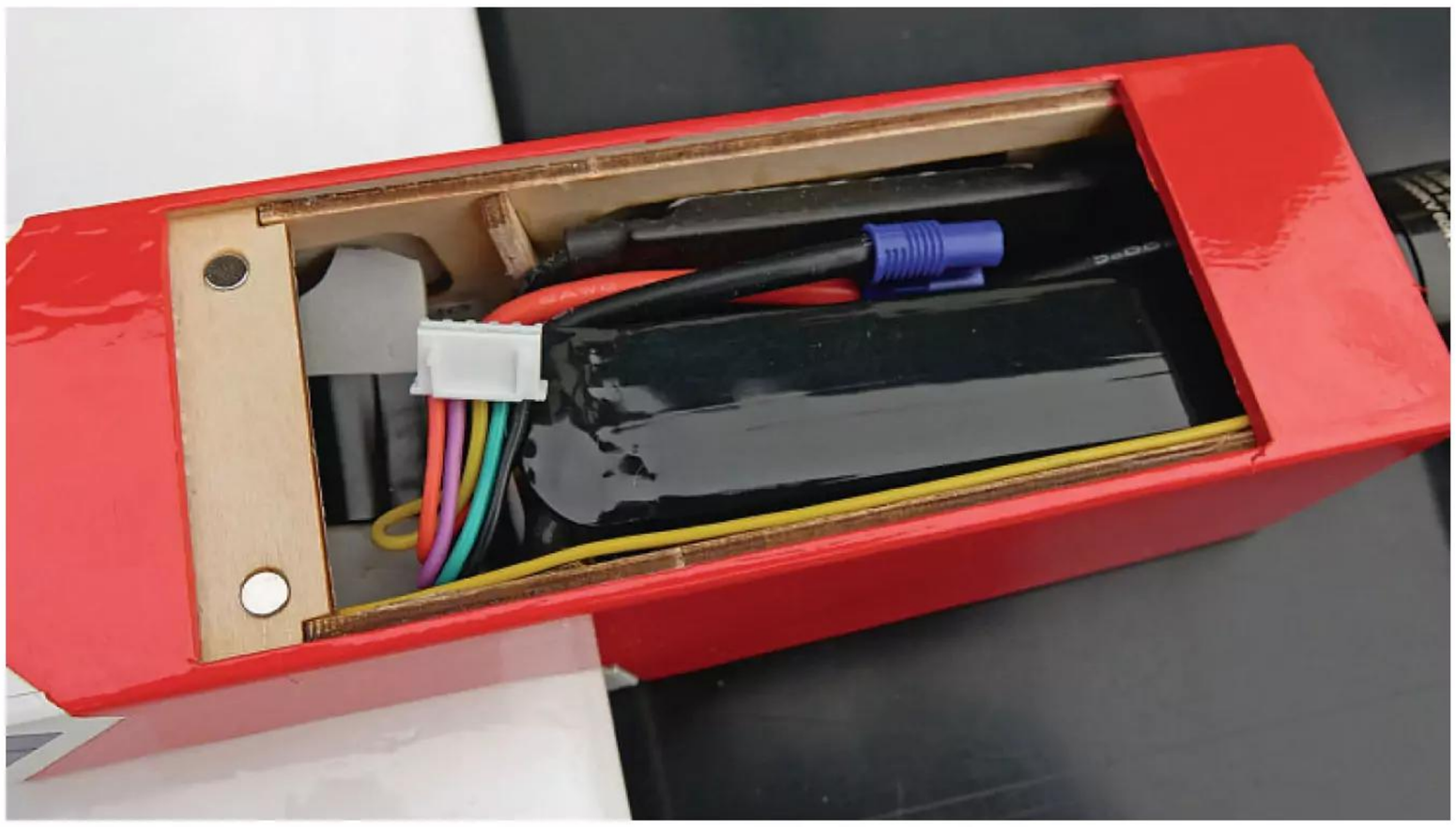
The elevator servo is glued in at the rear of the wing bay using another pair of mounting blocks. But I opted to use the Hitec plastic mounts, this time keyed to ensure a good gluing surface and bonded in place with 30-minute epoxy.

MOTOR IN

The firewall is predrilled to match the X-mount supplied with the Radient motor. You do need to shorten the mounting bolts and the motor shaft to stop them from protruding into the battery bay. This is easy with the correct tool, in this case a cutting disk mounted to a Dremel or similar rotary power tool. Care needs to be taken to wrap the motor in masking tape to prevent the ingress of swarf inside the motor. A bolt-on prop shaft is supplied to fit to the other end of the case.

With the motor now mounted attention turns to fitting the large (for the model's size) ESC, which is best mounted to the side of the battery bay. As usual I used Velcro to do this but in retrospect it would be better to use thinner foam tape as this would leave more space between the LiPo and the ESC to aid cooling.

The instructions say to use Velcro to hold the LiPo to the battery bay floor, but the packs used when designing the model must have been shorter than the 4S 2200 Radient pack that J. Perkins now supply as there's no way it will fit between the firewall and the front former. As you can see from the nearby picture it overhangs slightly. After a bit of experimentation, and some slight opening up of the former using my Dremel, it does all fit but it's very tight in there!



It's tight in there! The recommended LiPo overhangs a little bit into the wing bay.

The ply battery hatch is held in place with a tongue at the front and two magnets at the rear. With no battery it's a solid fit but with the LiPo on board it is raised slightly from the magnets. They still hold the hatch in place but do not feel fully secure, so I use a piece of red electrician's tape on the outside to make sure the hatch stays in place in flight.

FINAL CHECKS

With the LiPo being a snug fit I was worried that I wouldn't be able to move it around to achieve the recommended Centre of Gravity location. However, the instructions say, *"If using the recommended Radient motor and battery it should balance perfectly with the battery pushed up against the firewall."* This proved to be entirely accurate so no LiPo shifting was required for the test flights.

The instructions give suggested throws for intermediate pilots of 5 mm each way on all surfaces, increasing to 10 mm for experienced pilots. Now, I might rate myself as experienced in most circumstances but not with a fast pylon racer, so I thought I should play safe and start the test flights on low rates, with higher rates available using a switch on my Tx. Fifteen to twenty five percent exponential is recommended on all surfaces.

The JPS-3 was then taken to the field for its maiden flights, preceded by range and failsafe checks, plus a final control check. It's also important to 'range' the ESC before first use to calibrate it to your transmitter's

With its compact size, I'll be leaving this one in one-piece. It will be a perfect back up model for taking to the field with bigger aeroplanes.

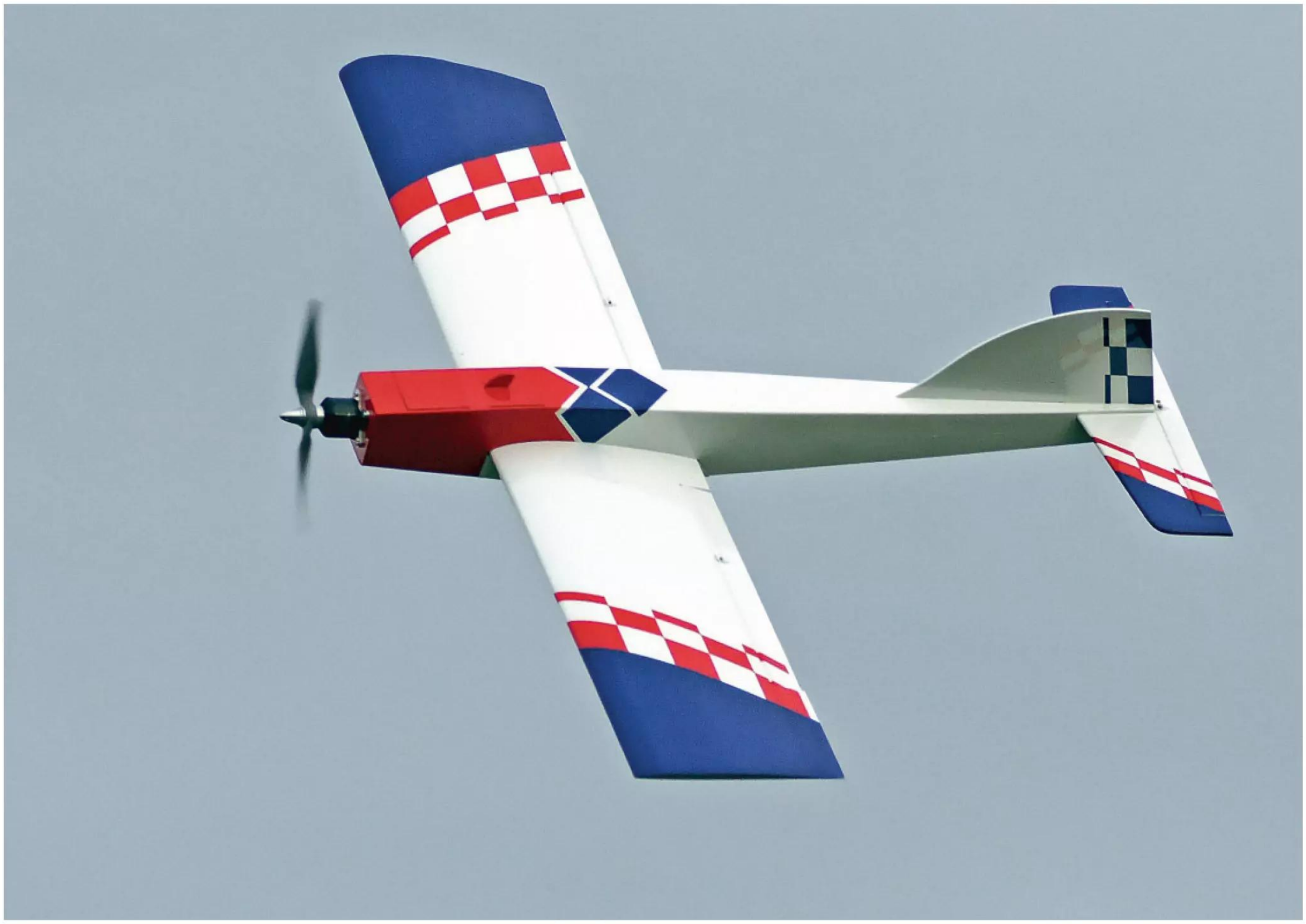
throttle stick. This is fully covered in the ZTW instruction sheet.

LET'S RACE!

Well, not quite as the model's first flights were used to get some flying shots in the can. With my buddy Barry settled in behind his telephoto lens, fellow clubmate Frank hoisted the JPS-3 aloft. As expected, the motor was providing lots of oomph, so I decided to proceed with caution and see her away at just under 3/4 throttle. The little E2K launched from Frank's hand at a fast but comfortable rate of knots. Everything seemed in order, so I spent a couple of circuits trimming her out, applying a tad of up elevator as well as a few clicks of right aileron.

It was time to line her up for Barry's camera and I spent a few minutes haring the JPS-3 up and down at low level as he hit his shutter button. When I spotted him taking a peek on the back of his camera, I decided the time was ripe to see what she would do at full throttle, upon which she took off like a scalded cat! Although she was flying a lot faster, she remained totally locked in and remained easy to control. By this time the sky had clouded over but the little model was easy to keep in view thanks to that bright colour scheme.

Box fuselage offers plenty of grip, so a gentle underarm launch is all she needs to get airborne.



The bright colour scheme is easy to orientate with even on overcast days.

Coming in low and fast for another glorious flypast!

In all the excitement I was mindful that I hadn't heard from my Tx timer for a while, so I brought the JPS-3 in for landing. Even at zero throttle the approach was low and fast, but eventually the speed dropped off and she slid to a stop. Big smiles all around!

After recharging the LiPo flight two got off to a good start following a solo underarm launch from yours truly. EPS-3 was locked in from the start and after a few more camera passes I pushed the go stick forwards again for some blistering circuits around the flying patch. Backing off a little, I put her through a loop or two, which she performed with ease over a large radius, and then some rolls. These too went well at low rates, although I did feel that a little more aileron throw would be beneficial for aerobatics. I then selected high rates and tried again. This time the loops were a little too rushed compared to the smooth ones she had performed on low rates, but the roll rate was much more to my liking. So, I think a mid-range setting is on the cards for future aerobatic sorties, with low throws on elevator and higher throws on ailerons. I usually use a 3-position Flight Mode switch so next time out I will leave the suggested low settings for getting my hand in at full throttle speeds, then have those combined low elevator and high aileron settings available for aerobatics. Position three will give me full rates when (if!) I eventually make it to an E2K pylon meeting. I also need try her on the IC prop. During static tests both APC 8" x 8" props drew the same at around 55A and 790W. The E prop is fine for sport use but an IC prop must be fitted for pylon racing - it's in the rules!

Even if you don't intend to race her, I can heartily recommend the JP EPS-3 for anyone who gets a buzz from flying fast flying model aeroplanes. She's a little pocket rocket for sure. You won't be disappointed. ■

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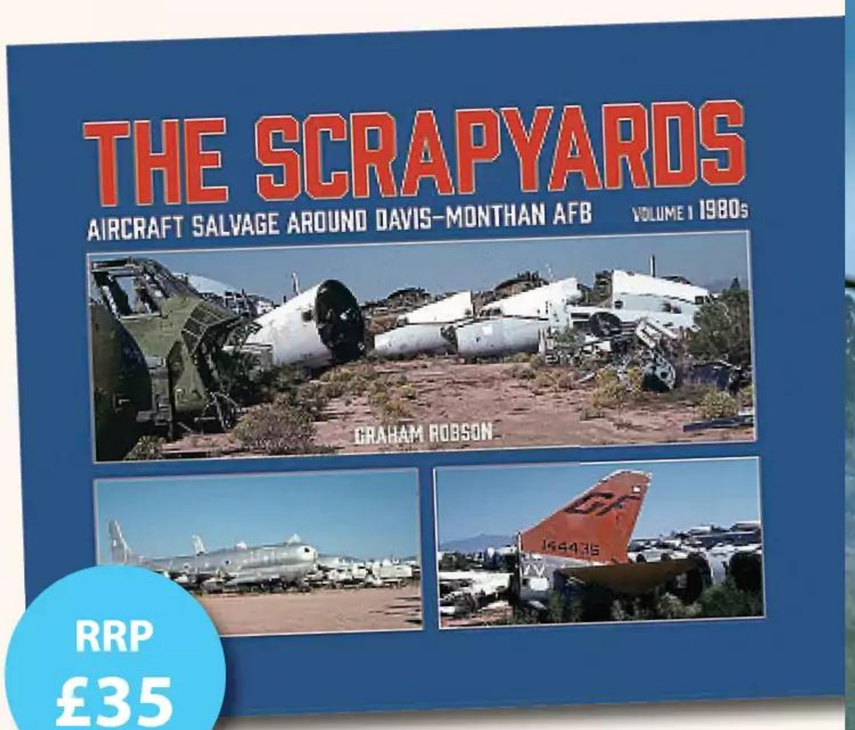

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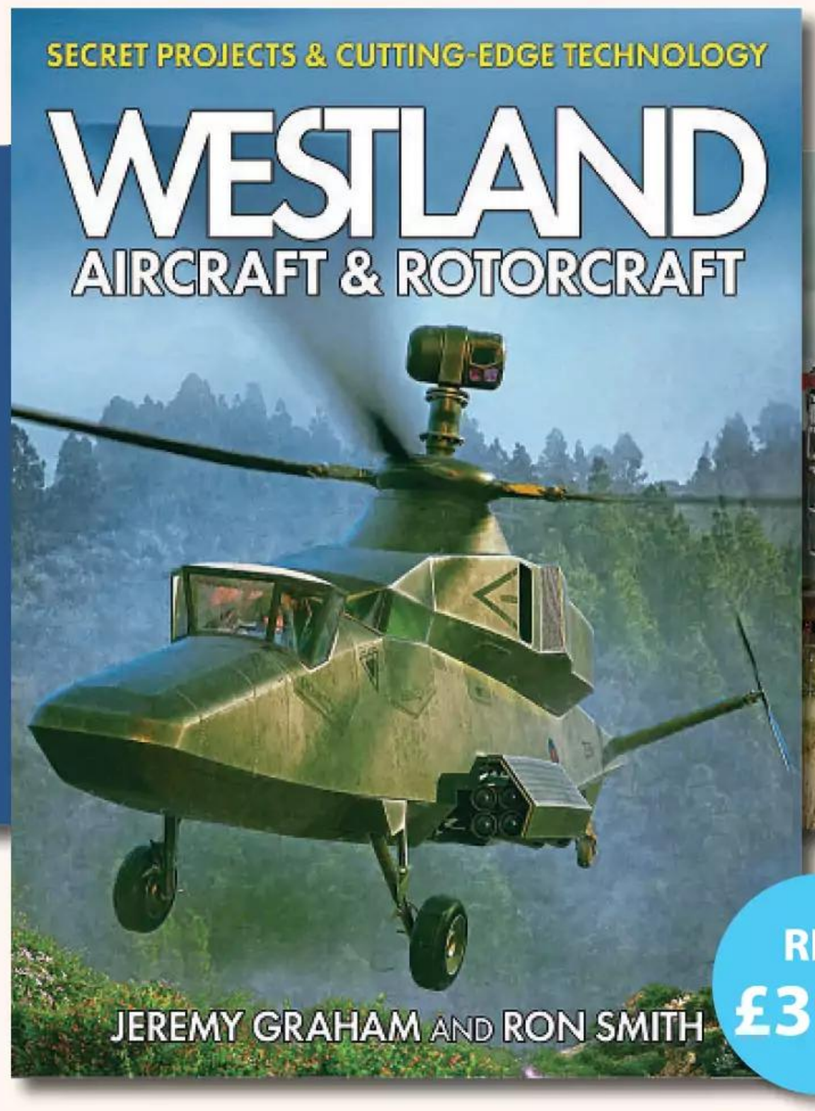

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MORE INFORMATION

Motley Crew displays the completed Orlik. See 'Project Conclusion'.

FITTING THE CANOPY

Chris Williams shows how to fit the canopy of a scale glider to its frame

words & photos **Chris Williams**

The Olympic Orlik in action at White Sheet

Early stage of canopy fitting. The blue tape delineates where the major trimming needs to be.

Much closer to home now. Note the centre markings on the canopy to line up with the markings on the fuselage.

A recent inquiry raised the subject of fitting the acetate canopy of a scale glider to the canopy frame. Given the not inconsequential cost of buying the thing and then getting it in the post, it's not surprising that some people need a drop of the falling down water before embarking on the task. Having fitted more than my fair share of the darn things, here are some thoughts...

CUT LITTLE & OFTEN

Number one involves that old carpenter's mantra 'cut little and often', some of the wisest words ever put together. As you work your way to the finished job, cutting here, cutting there, the goalposts will move slightly after some of the cuts, especially towards the end game. My solution works thus:

Cut off the unwanted ends of the moulding and then offer up to the canopy frame. Did I mention that the frame needs to be fixed in its resting place on the fuselage? Now you can roughly cut off the excess material, leaving plenty of it left over for more, but finer trimming. Mark out the centre points on the top of the fuselage, front and back, and then apply some bits of tape to the front and back of the canopy and mark matching lines on the tape. This will give you a reliable reference point for your continuing endeavours. Also, if the fuselage is to be covered with film, use tape on the fuselage for the centre marks, as ball-point ink is very likely to show through the film.

Now, use fine line masking tape or similar to mark out the shape of the aperture, still leaving enough material for further adjustments. Concentrate now on the front and back, taping and trimming until the canopy finally drops on to the frame. At this stage you can delineate the sides of the canopy with the tape, always remembering to cut the correct side of the tape!

As far as adhesive is concerned, I have always used Pacer's ZAP Canopy Glue PT-56, which dries clear, thus making any splashes less obvious. To avoid even this embarrassment, I would usually mask out part of the inside of the canopy near the rails etc. before gluing. Having applied the glue (with the canopy frame still being attached to the fuselage) masking tape is ideal to pull the canopy down on to frame.

Almost there! The masking tape pulls the canopy snug to the frame.

The accurately fitted canopy on the recently completed Orlik 3 airframe, ready for its film covering.

Motley launches the Orlik for its slope maiden.

The Orlik in action at White Sheet.

"The most embarrassing moment came when I realised that I had ply-sheeted the fuselage without first fitting the wing joiner box"

Leaving it all to dry overnight should result in a structure that is the correct shape relative to the fuselage (i.e. without any twist) and ready for action.

PROJECT CONCLUSION

For many years, when it comes to the gull-wing sailplanes, the Orlik has been the 'one that got away'. But now I've caught up with myself and this pretty sailplane finally came under my microscope.

Designed in 1939, the Orlik 3, or Olympic Orlik, was built for the Olympic Games. Little seems to remain of this series of glider and the usual trawl of the internet reveals only one example, currently residing in the USA. Despite Martin Simons' drawing showing no landing wheel, the American version seems to have one anyway, so I have included the same on mine.

Full disclosure now, and I'll admit to the biggest scale crime on this model, which applies to the airbrakes. The full size has a forward-facing flap on the front of the underside of the wing, ideal for ingesting grass on the slope, or worse, and getting ripped off and left in the grassy wake of the landing run. Top spoilers were used instead and have proved more than sufficient, especially in conjunction with the simultaneous raising of the ailerons.

The most embarrassing moment came when I realised that I had ply-sheeted the fuselage without first fitting the wing joiner box. The fix was to reduce the depth dimensions of the box and spend a lot of time fiddling about in order to squeeze it in. Due to the reduced size, a couple of bolts were inserted to prevent the brass boxes exiting the structure at the bottom in times of maximum stress.

The embarrassment grew even greater when the wings folded at the bottom of a loop and it turned out that one brass box had exited the joiner box in an upward direction instead, taking the port wing root fairing with it. I deposited the sad remnants in the hangar and let things lie for a couple of days. When I looked at her again, I thought maybe a repair was actually on the books, but I still remain surprised that it took only another couple of days to put it all back together again, such are the benefits of using covering film instead of fabric and paint.

The new joiner box, restored to its proper dimensions, was fitted by leaving the brass box out on one side and then gluing it in at the same time as re-fitting the wing root. (Yes, it now has four bolts on both sides of the brass).

Top spoilers have proved more than sufficient for landing, especially with simultaneous raising of the ailerons.

Not as bad as it looks, taking just two days to repair.

She is really nice to land, with lots of float before touching down.

"…the proper order was once again restored, although for some reason I have been reluctant to loop her again"

The re-maiden was no threat to the incompetence trousers and the proper order was once again restored, although for some reason I have been reluctant to loop her again. As the wing section of the full size seems to be pretty thin, I opted this time around to keep the HQ section at 12% throughout, which may be why she is really nice to land, with lots of float before Terra Forma [sic] Reintegration is achieved.

Pre-maiden at County Model Flying Club.

Orlik on tow above the CMFC patch.

At the time of writing the next project is completed and ready to maiden. This is also a gull-wing machine and I can assure you that the wing joiner box sports its fair share of reinforcing bolts!

A QUESTION OF BALANCE

Some years ago, I devised a device for accurately measuring the position of the Centre of Gravity on my models. It proved moderately popular and now seems a good time to introduce it again. Visit this link for a PDF of my drawing:

https://www.modelflying.co.uk/wp-content/uploads/sites/8/2025/02/cg-locating-stand.pdf

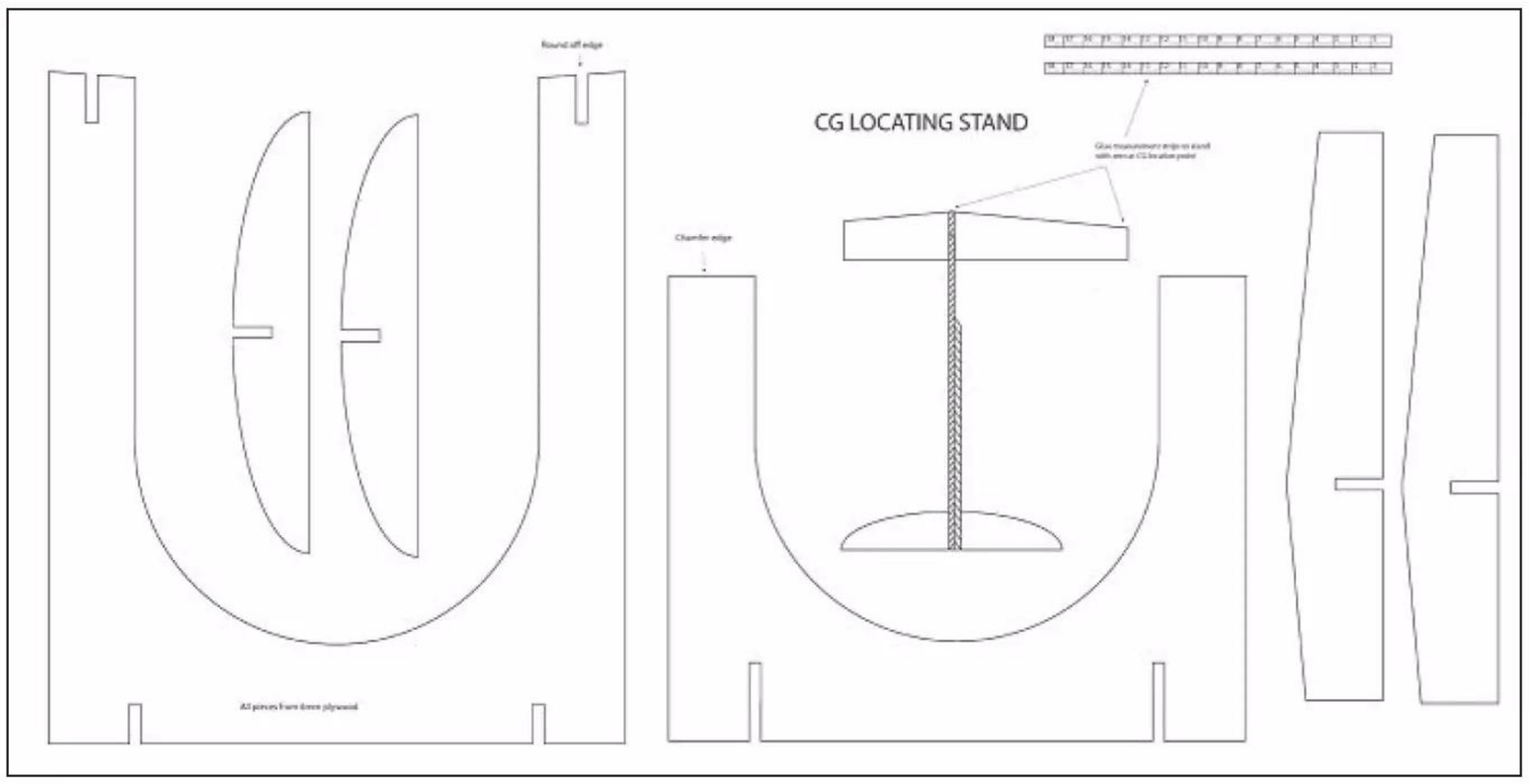
It's made from 6 mm ply, the better to withstand the weight of the larger models I used to build, but it works on most of my designs. You really need a calm day to use it outdoors and you need to stand vertically above the wings' leading edges to read off the CG position on the scale.

I recently induced some cracking of the lower sheeting of a gull-wing model due to the wings only resting on a small portion of the stand because of their upward angle. This was simply rectified by taping some ply plates to the wings' lower surfaces in order to spread the load.

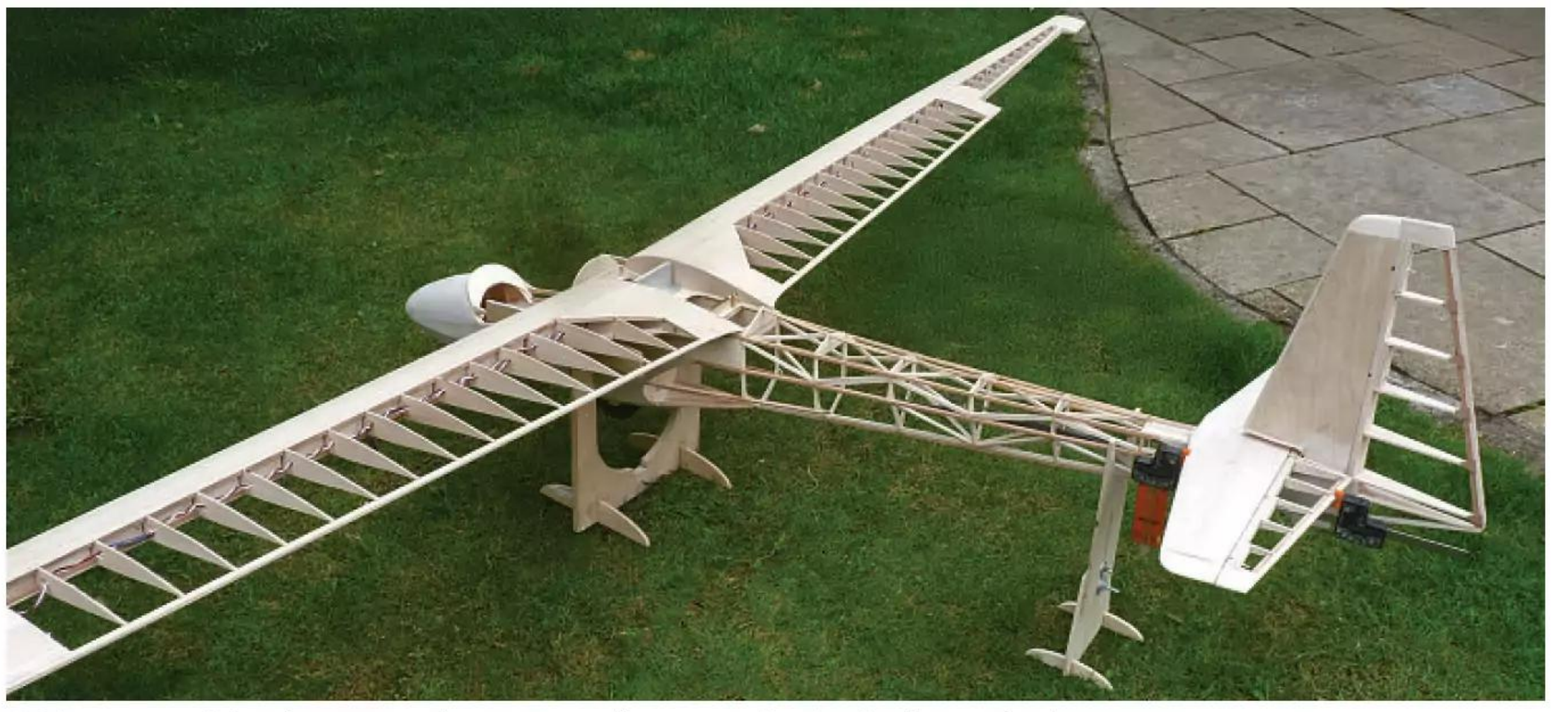
To make it even more useful, I designed an adjustable stand for the rear of the fuselage that enables you to set up the tailplane at zero degrees, the better to measure the decalage.

Email the author for free copies.

c_williams30@sky.com ■



Visit the nearby link to download a full-size drawing for CW's 'CG Locating Stand'.



CG locator and decalage setter in use. Best choose a quiet day in the garden!

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PITTS SPECIAL S-2B

***Stuart Mackay** puts together Hangar 9's 50 - 60 cc size kit of a British registered aerobatic biplane*

Words & Photos **Stuart Mackay**

I have built and flown several Pitts biplanes and their derivatives during my model flying career and I always missed my red Practical Scale Pitts S-1 that I flew a lot at public shows many moons ago. So, looking for something that fitted into the back of my Volvo estate and which could use a Zenoah 74, led me to Pegasus Models in Norwich, who found out the cowl dimensions for me. A quick measure up of the ZG74 and silencer showed that it would fit - just!

This engine is heavier than the recommended DLE 60 Boxer twin, but I like quiet models with a good reserve of torque and the large canister silencer and electronic ignition I had fitted to the Zenoah had proven themselves already. Money exchanged hands and the back of my Volvo was filled with an enormous cardboard box!

THE FULL SIZE

The Pitts Special S-1 and S-2 are a series of light aerobatic biplanes designed by Curtis Pitts and they have had many competition wins since the type's first flight in 1944. Pitts aircraft dominated world aerobatic events in the 1960s and 1970s and even today they remain potent competition aircraft in the lower categories.

I was curious and wanted to find out more about UK registered G-EFIZ, the subject of the kit, so I contacted Rich Goodwin, who owns her still. Rich is an ex-RAF fast jet pilot and his first biplane was a Christen Eagle which he used to compete with reasonable success at British Aerobatic Association competitions. Then he switched to airshow flying and developing his Pitts S-2S.

G-EFIZ is an original factory-built airframe, made by Aviat Inc. as S-2B, serial no. 5224. It was registered on the 3rd of November 1991 as N789JB. Certified aircraft cannot be modified, unlike the home-built versions such as G-EWIZ, which is a heavily modified S-2S and Rich's highly modified airshow single seat Pitts.

G-EFIZ was exported from the USA to Bulgaria in 2004. In 2014, Rich needed to get hold of a Pitts quickly as he was having problems with G-EWIZ. Over a period of five days and nights, Rich drove non-stop to Sofia, dismantled the Pitts and packed it onto an 18-foot trailer. On the return journey he experienced delays at every national border he crossed and in Serbia he was even accused of trying to smuggle a spy plane! The aircraft was reassembled and put on the UK register as G-EFIZ. It is the sister aircraft and two seat version of G-EWIZ.

Struggling to find sponsorship for his team, Rich approached many different brands until, eventually, a friend introduced him to Anana Ltd., a Bristol based technology company. Anana has been a great company for Rich to be part of and it

Stuart with the finished Pitts Special.

Who can fail to be charmed by a Pitts biplane.

continues today as Sabio Ltd., whose branding can be found on all Rich's display aircraft.

The Rich Goodwin Aerobatics team are now focusing on the Jet Pitts G-JPIT to encourage STEM and are also teaming up with AC-Aero in the USA to develop a new watercooled engine with the aim of 'going green' using unleaded fuel and having more efficiency.

"I was curious and wanted to find out more about UK registered G-EFIZ, the subject of the kit"

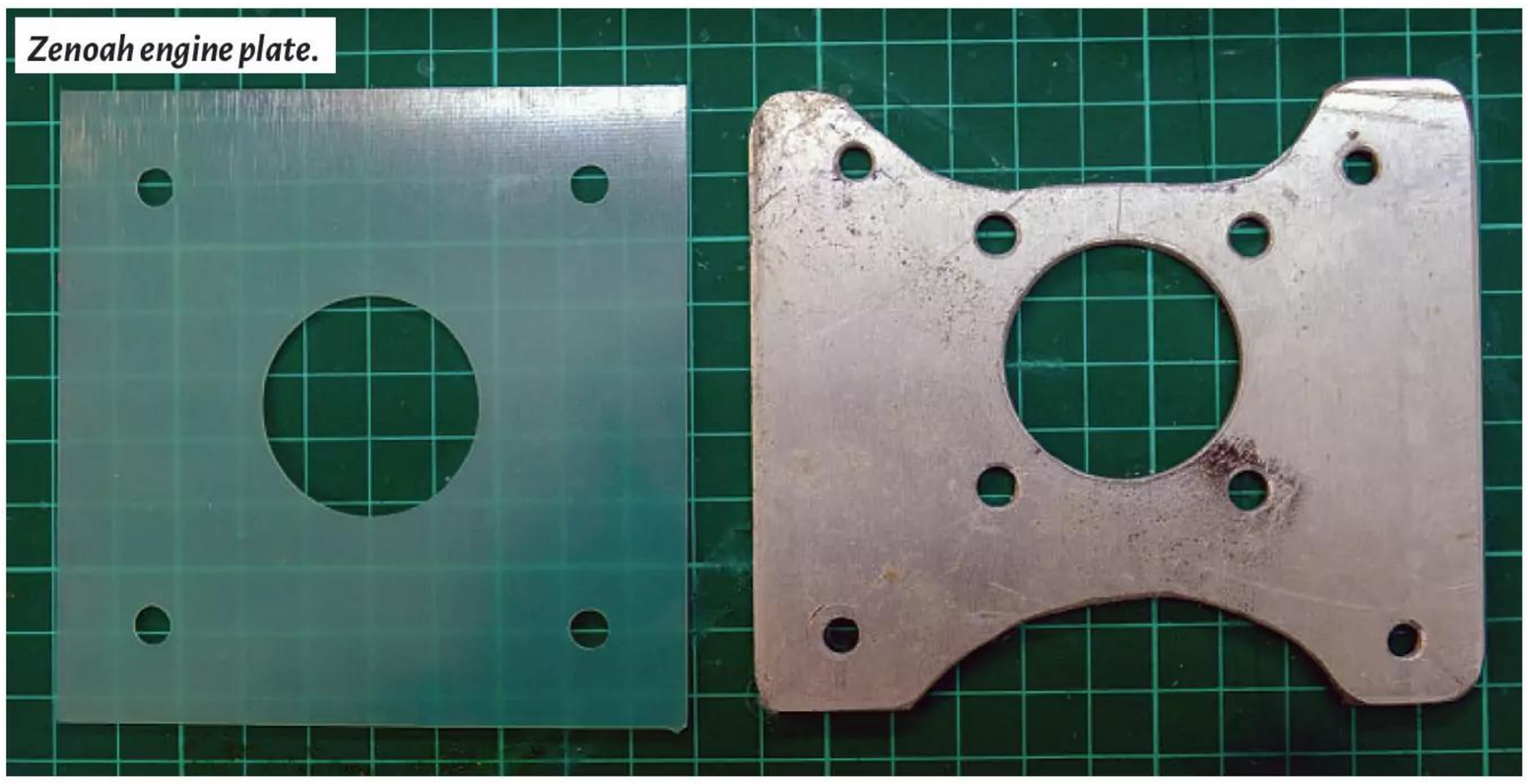
MODEL ORIGINS

Rich had met my old friend and great ambassador for our sport, Ali Machinchy Jr. at a Weston Park model show where Ali had seen Rich's display. Subsequently, Rich invited Ali to display his models at Bidford Flying Club in 2014.

Time moved on and Ali went to work in the USA for Horizon Hobby. A few years later, Ali asked if Horizon could use G-EFIZ as a basis for a large-scale Pitts that they were designing. Rich agreed without hesitation and so today he is thrilled to see many replicas of 'his' aircraft now being flown.

OPEN THE BOX & SHAKE!

The beautifully made airframe components come in a huge box. Fragile parts are either foam or bubble wrapped to protect against travel damage from Vietnam, where the model is manufactured to Horizon's design. The fit and finish of everything did not disappoint.



Zenoah engine plate.

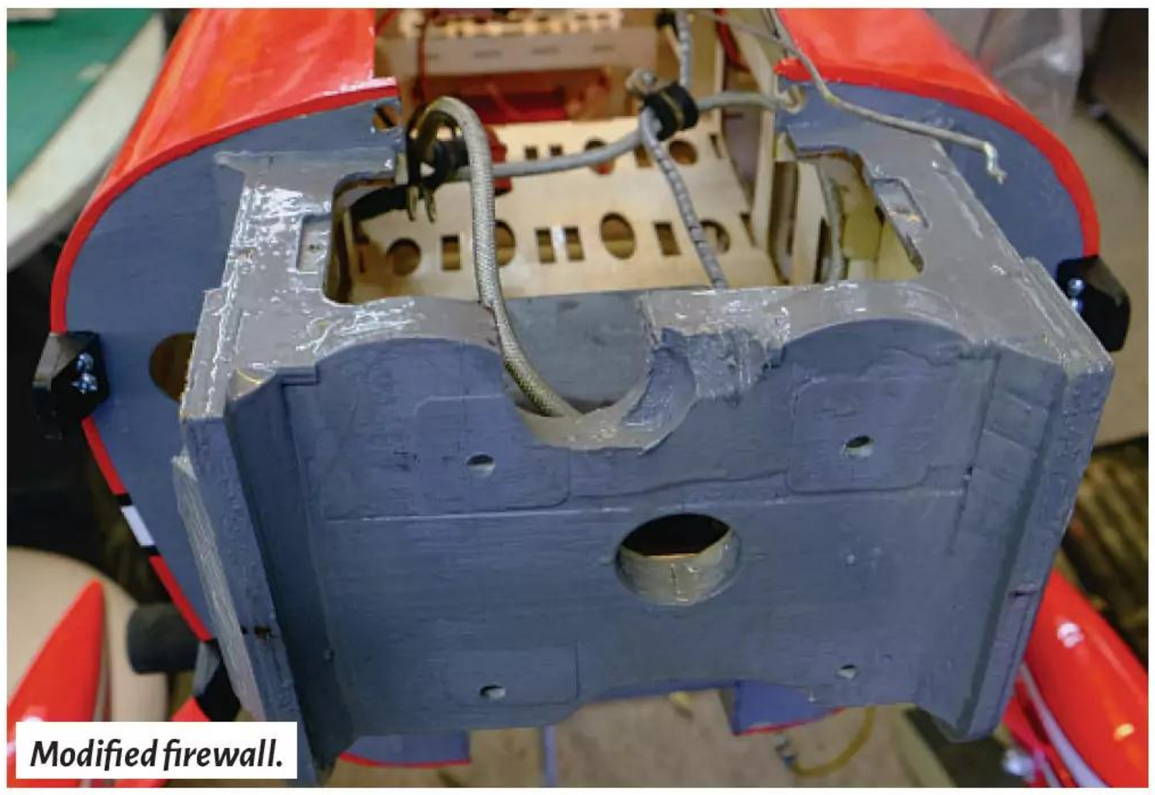
The structure consists of laser cut lite-ply and balsa parts, with the fuselage longerons being carbon rods to add strength and robustness when handling. The film covering is as close to perfection as one could wish for and the paint finish and lining on the moulded cowling and wheel spats is also first class.

Horizon have made some modifications to the airframe to improve the flying, practicality and general handling of a model sized Pitts. These modifications include plug-in wing panels, quick release interplane struts, increased rudder and fin area, radio/battery access hatches and the massive quick release canopy and hatch which makes installing and accessing the airborne flight pack so easy.

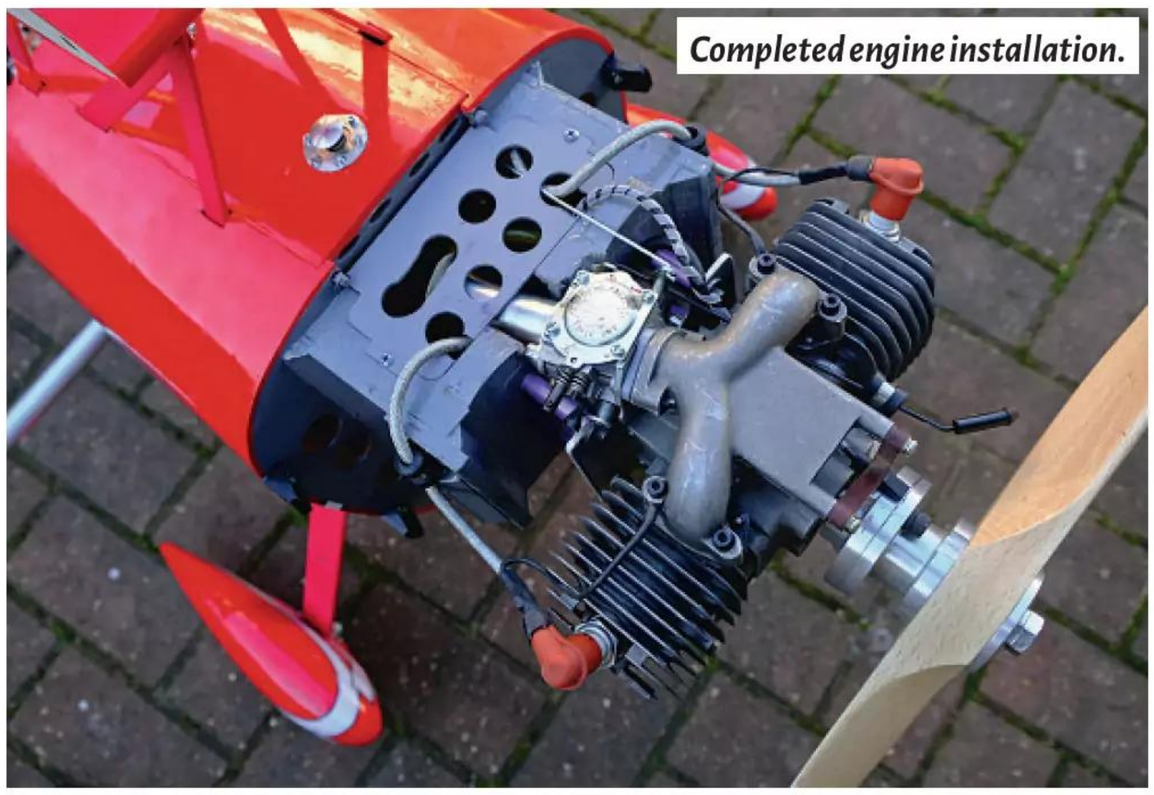
Horizon specify the aircraft to be powered by a DLE 60 or the Rimfire 50 electric drive system. If I had chosen one of these the aircraft could be taken from box to first flight over a long weekend of work of about 30 hours or so. The instruction manual is excellent and covers nearly everything you need to know. The recommended assembly sequence commences with the wings and tailplane, then moves onto the fuselage. For handling reasons, I chose to have the wings and fuselage in build at the same time but elected to fit the Dural undercarriage legs and tailwheel first so I could work on the fuselage on the bench. I elected to fit the stabiliser and rudder last to avoid damage during the assembly process.

ENGINE MODS

The most significant change that I have made to the model is installing an engine that the model was not designed for. The Zenoah 74 I wanted to re-use (the ZG 80 is identical in size) needed a new mounting plate making up to replace the

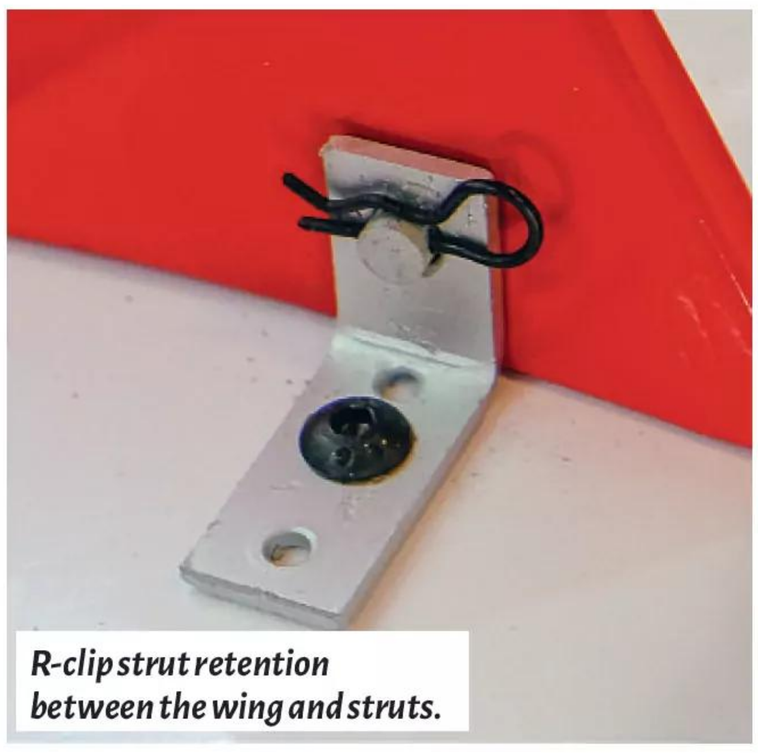


Modified firewall.



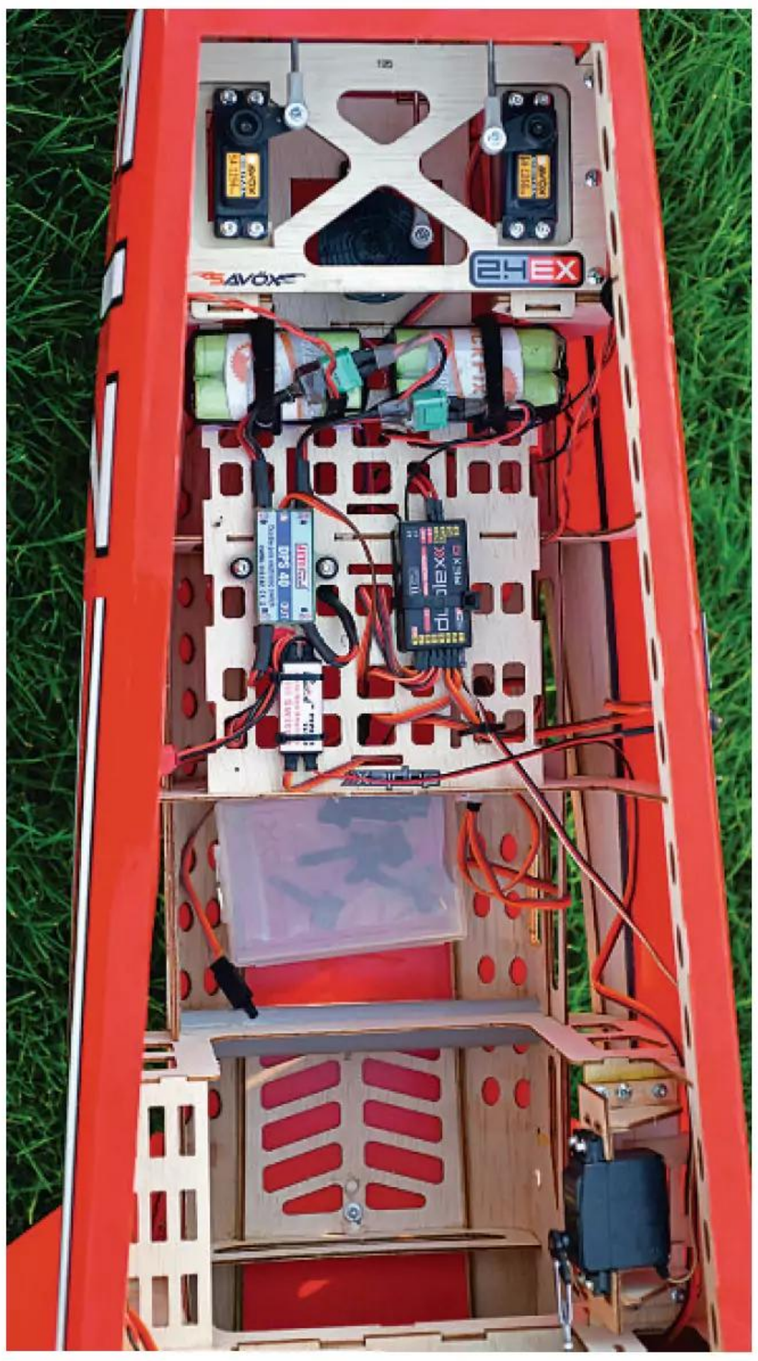
Completed engine installation.

Don't hold here! Undercarriage fairing breakage.



R-clip strut retention between the wing and struts.

"When combined with the larger silencer I knew that excessive noise would not be an issue"



Radio installation.

standard Zenoah 3 mm aluminium mount which was around 10 mm too long to allow the engine and silencer to fit within the cowling. So, using the drill template provided for the DLE, I designed a 3 mm aluminium plate that would not only attach to the back of the Zenoah but also allow the mounting bolts and captive nuts to locate onto the epoxy plate reinforced areas of the ply firewall.

The firewall area also needed some modification using a rotary tool to allow clearance for the carburettor manifold and canister exhaust. This involved a lot of fitting and removing the engine, silencer and cowling until sufficient clearance had been achieved. I was happy when everything lined up and fitted within the cowling, which only required minor modification for the central single exhaust of the Practical Scale stainless steel, long, '2-into-1' silencer.

Using the standard length, short Zenoah prop driver to keep the overall length of the installation inside the cowl I was satisfied that, despite the increased weight of the Zenoah (2700 g bare versus 2000 g of the DLE), I still had a practical proposition which turns a larger 24-inch prop at around 6000 rpm as opposed to the 22-inch of the DLE. When combined with the larger silencer, I knew that excessive noise would not be an issue.

I refitted the engine mount floor a bit higher to clear the silencer and the firewall was touched in using grey primer and sealed with a coat of laminating epoxy before finally mounting the engine using the supplied stand offs and associated hardware. The Falcon electronic ignition (operated by an RCXL electronic switch) was mounted immediately behind the firewall in front of the Dubro 40-ounce tank. The choke is operated manually by means of a pushrod accessible through the cowl inlet.

A FEW ISSUES

The rest of the assembly proceeded rapidly. The only other issues I faced were finding out how flimsy one of the undercarriage fairings was. The rear section cracked just behind the gear leg when I picked the model up using it so I would suggest that Horizon either use a stronger piece of wood for this or at least forewarn builders that the rear of the fairing should not be used to handle the model! I also had one of the stub axle threads fail and stretch when tightening but this was resolved overnight by Horizon's UK distributor.

I was sceptical about the method used to retain the interplane struts to the wings using sprung R clips pushed through aluminium shear pins. Everything fitted okay until it got to the lower LH wing strut fixing. But try as I may the only way I could get the strut pin to align with the bracket was to run a 5 mm drill through it. Not ideal but it all fitted together eventually. The interplane struts took me about five hours to fit nicely and proved to be one of the biggest jobs on the model. I nearly got the incidence meters out to check if the left-hand

Aileron servo installation.

Kay helping to check the CG. Still smiling!

panels were misaligned, which was surprising because everything else fitted so easily and precisely on the model. These fittings do seem overly complicated and there is a real danger of losing a clip during assembly at the flying field. Therefore, I retained them using small tie wraps to ensure they don't get separated in transit. Notwithstanding the above, they have proven entirely adequate for the flight loadings, so maybe I am worrying unnecessarily.

RADIO FIT

I was using my Jeti radio for the initial flights and a Jeti electronic switch to switch two Li-Ion 18650 packs mounted at the rear of the radio bay for ignition and radio. My chosen Savox servos all fitted without modification in the prepared servo openings in the wings and fuselage.

The manufacturer had added cotton servo wire pull throughs in each wing panel which made the installation of the four aileron servos to their moulded servo mounts very simple. I also added heat-shrink tube over the servo plug and socket joints to secure them and finally added a foam block to stop the extension leads from disappearing back into the wing cavity.

The four aileron pushrods needed to be 90 - 92 mm between clevis centres instead of the 87 mm prescribed in the instructions. This may have been caused by my use of Savox servos instead of Spektrum A6380 units, with their different dimensions.

Wing transport jigs and first flight assembly.

FINAL CHECKS

My better half, Kay, used all her strength (but still managed to keep smiling!) to help me check the balance of the finished model using the supplied jig. All seemed okay and the model balanced only slightly nose down, which was a relief considering the use of a heavier engine. The model weighed 23 lbs. dry on the scales.

The last job was to refit the gear fairings and glue the supplied dummy radio antenna in place. Yes, it does go between the undercarriage legs and NOT on the fuselage top!

The engine was test run in the model on a Menz 24 x 10 two blade prop and was giving 5900 rpm on the ground with plenty of pull. No excuses now, so...

LET'S COMMIT AVIATION!

A few days later, with batteries fully charged and perfect blue-sky conditions, it was off to the wonderful flying site at Binham in North

First take off.

On a knife edge pass.

Diamond livery on the underside.

On approach to land.

Norfolk to get some air under her wings.

I assembled the model and was glad that I had made some plywood transport jigs for the wings as this only took five minutes to complete at the flying field

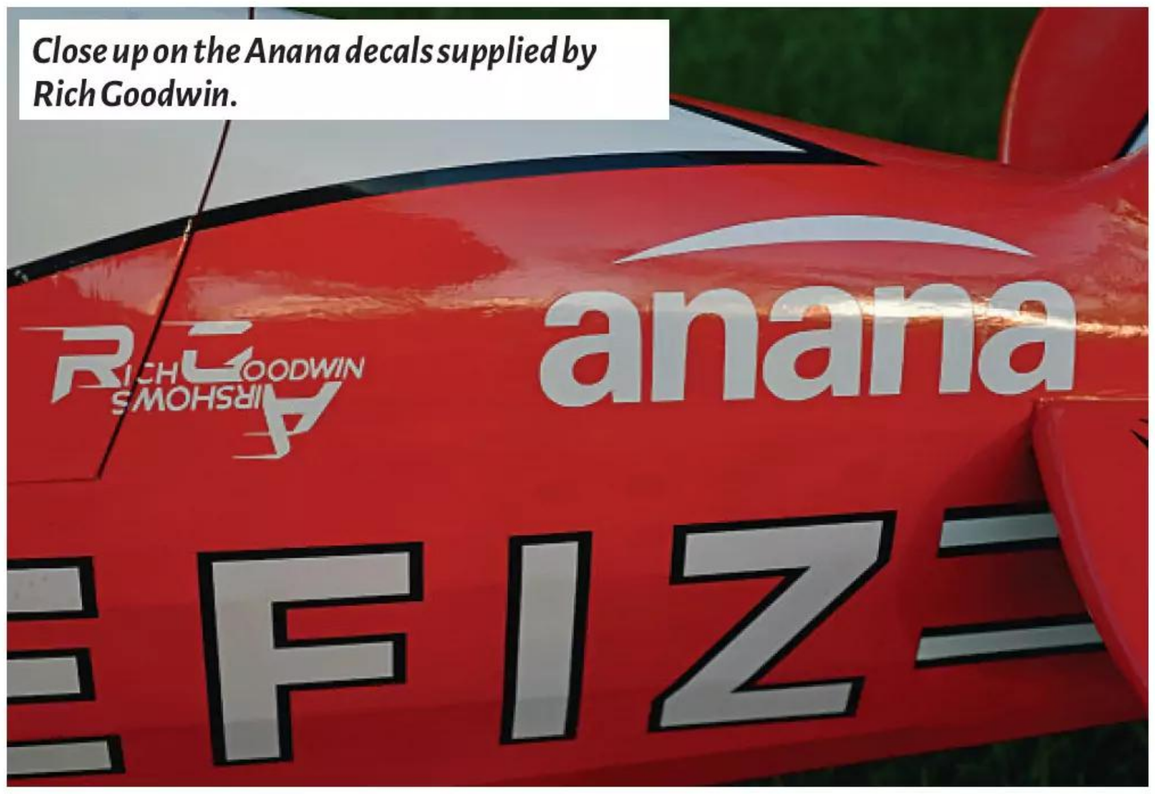
I had test run and set up the Zenoah at home previously so a range check with the engine running to check the Jeti failsafe with the model restrained was completed. A few taxi runs were made to check tracking and that nothing would fall off when the motor was running. This showed a tendency for the model to nose over if full up elevator wasn't held on. Hmm, is it too nose heavy?

I opened the throttle slowly using full up elevator and eased this off as the Pitts gained speed. After about 20 yards she was airborne and climbing. A couple of trimming circuits at altitude showed that a couple of clicks of up and right aileron on the Jeti Tx were all that were required and then she was flying hands off. The Zenoah was running well and half throttle was all that was needed for the Pitts to zoom around the sky - very quietly! Full throttle was only used when the nose was pointing straight up and she just went on and on!

With confidence building by the second, I decided to check the knife edge trim. There was no pitch or roll coupling with rudder applied, unlike most other Pitts that I have flown. This one tracked like an arrow across the sky! Up to height again and the stall behaviour was checked, but nothing nasty became apparent, with no wing drop or incipient spin present. Will it do gyroscopic manoeuvres? Well, yes, and as soon as you release the death grip on the sticks it stops spinning. Loops and rolls in both directions showed that the recommended factory throws on low and high rates were correct. This aircraft flies as if on rails so I brought it down for some low passes.

After about ten minutes of enjoying myself, I put it into a rectangular landing pattern and gradually wound the throttle off on finals, only to find the Pitts not slowing up as much as I wanted. With throttle trim reduced further the approach showed what a long flat glide it has

> "Loops and rolls in both directions showed that the recommended throws on low and high rates were correct"



Close up on the Anana decals supplied by Rich Goodwin.

I retrofitted this Krumscheid 728 alloy spinner.

and allowed for a nice three-point touch down. I taxied in and switched the engine off. Big grins all round!

ON REFLECTION

A couple more flights that afternoon saw confidence building.

On reflection, I decided to try a more rearward balance point to tame the nose over tendencies at slow speed when on the ground. Some additional wheel weight ballast was added temporarily under the tail to move the CG to suit my flying style before permanent ballast was fitted. Maximum rear CG is 165 mm on upper wing.

Rich Goodwin kindly sent me some 1/3 scale ANANA stickers and I applied then to the model's fuselage to further improve the aircraft's scale fidelity with the original. I also decided to replace the red plastic spinner supplied with a scale aluminium spinner from Krumscheid (type 728).

My thanks go to Ali and the team at Horizon for design and developing a great flying airframe. If you are a Pitts Special fan then what's stopping you from getting along to Pegasus Models in Norwich. Tell them Stuart sent you!

If you want to know more about this 71.6" span model then visit this link: **https://www.horizonhobby.com/product/pitts-s-2b-50-60cc-71.6/HAN2390.html** ■

A very happy pilot.

Pilots' Pictorial

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DB SE5

This 80-inch wingspan, 1/4 scale SE5 had been on my Bucket List to build for more than 20 years. I purchased it directly from DB Sport & Scale in 2023 and began the build in 2024, which took me about 13 months to complete.

I powered the SE5 with a Leopard 6362-10T 210KV Outrunner motor, a Castle Creations Edge 120A HV ESC and 2 x 5S 5000 mAh LiPos, configured in series.

I redesigned the tailskid to include two WW1 wheels, either side of the skid, to expedite retrieval of the aircraft from the runway. The SE5 weighed just under 19 lbs. on completion. The photo was taken after a successful maiden flight at the Tokay RC Modelers Club, near Walnut Grove, California.

Nigel Watson

SHORT STIRLING

Steve Parker has been a longstanding member on Amman Valley Radio Control Club. He's a modest guy who doesn't publicise his building and designing talents. He has finished a selection of projects over the years from a mixture of kits and plans (Avro 504N, DH71, Catalina, Chipmunk) and own designs (Junkers F13, FW200 Condor, Short Sunderland) and the Short Stirling shown here. All are balsa built and except for the F13 are electric powered, with wingspans around the 72" mark. These are the kind of projects which inspire both newcomers and experienced modellers to stretch their building and flying skills.

Jon Walter

WRONSKI BEAT

The Vulcan project is a development project which will be available as a kit later this year (an EDF version, a turbine version and a PSS version). I wanted to offer this classic aircraft as an easy to build model and significantly reduce the build time compared to some other versions, so the model features a combination of a moulded fuselage and foam core wings and tail. It's an interesting project spanning more than two years and is super impressive in the air.

The Constellation and Republic Rainbow are both scratch built using hot-wired blue foam for the fuselage structures, sheeted with balsa and pro-skin sheeting, with foam core wings and ply inserts to carry the structural loads like spars and landing gear.

As regards the models having flown, the EDF Vulcan and the Republic Rainbow have both flown. I haven't flown the Constellation yet, nor the turbine Vulcan, although high speed taxi and power checks have been done on both. Although English, I'm resident for a portion of the year in the beautiful small island of Ibiza and lucky to belong to a vibrant but super relaxed R/C club here on the island - the only Englishman! We are taking these models to a club with a much larger field in Mallorca soon, simply because their strip and space dwarfs our own flying site here in Ibiza.

Brian Wronski

MEGA DEAL!

RCM&E

KEVIN CROZIER,
EDITOR

Welcome to RCM&E. In each issue we aim to bring to our worldwide readership the very best selection of radio control model aircraft news, views and kit reviews, alongside informative and entertaining feature articles covering each and every aspect of the diverse model flying and building hobby.

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ST8US

***Mike Freeman** introduces his one-metre span EDF flying wing built entirely from foamboard and brown paper*

Words:**Mike Freeman,** Photos:**Mike Freeman, Al Freeman**

I've been really pleased with my Hi8us flying wing model which featured in the July '22 issue. That is until one winters day when I launched it and the spinning prop clipped a knuckle as it flew past! I hadn't heeded my own advice to quickly get my hand out of the way. Thankfully, I had gloves on and they took the brunt, but it still hurt!

To avoid the risk of it happening again I decided to build an EDF version using one of the tiny 50 mm Powerfun units that George at 4-Max Models sells. These delightful little units are very reasonably priced, but I was shocked at the cost of balsa these days. Whilst searching for a cheaper alternative I remembered a model I'd designed 33 years ago called Omnibox which had a boxy fuselage and tailplane made from foamboard. I thought it might be time to have another go with this mysterious material but was sure, with my subsequent years of aeromodelling experience, I could come up with something a little more elegant. After a very interesting and rewarding learning curve and three prototypes the St8us you see here finally emerged.

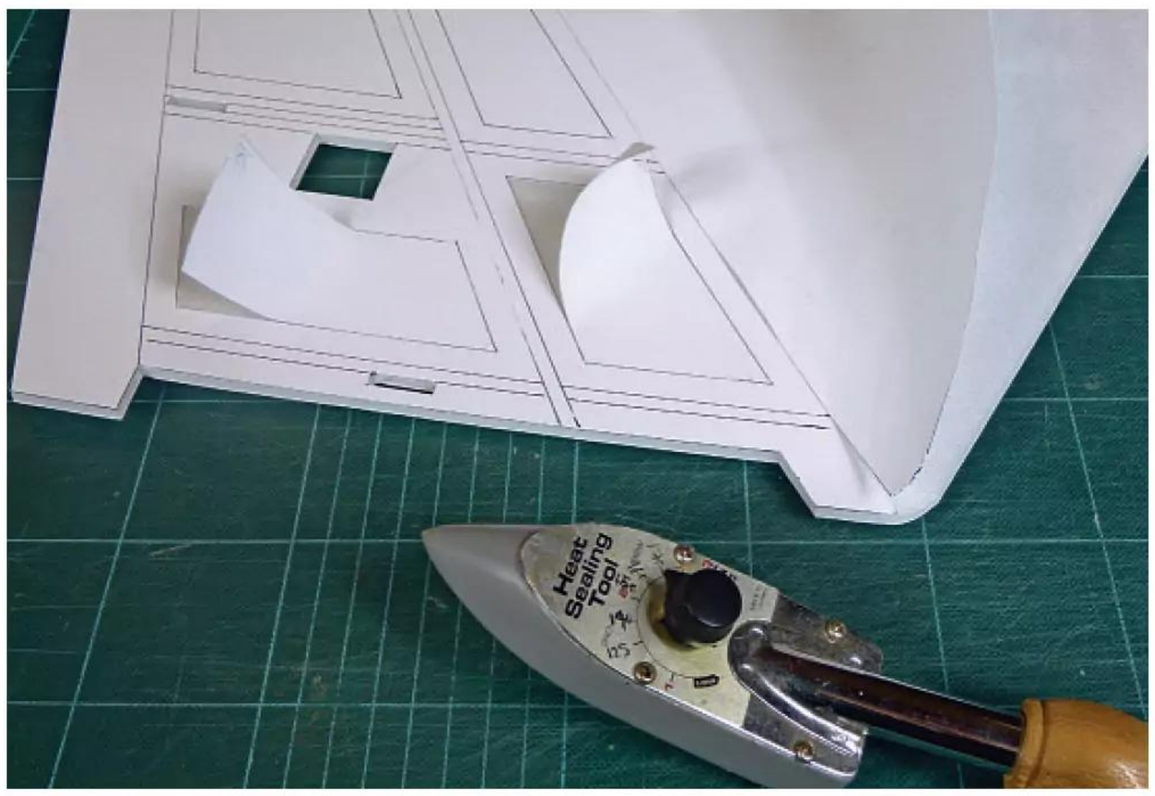
Half throttle and a good lob gets St8us away nicely. No risk of a rapped knuckle with this one!

My first attempt using foamboard was 33 years ago on this rather boxy looking own design EP called Omnibox.

BUILDING ST8US

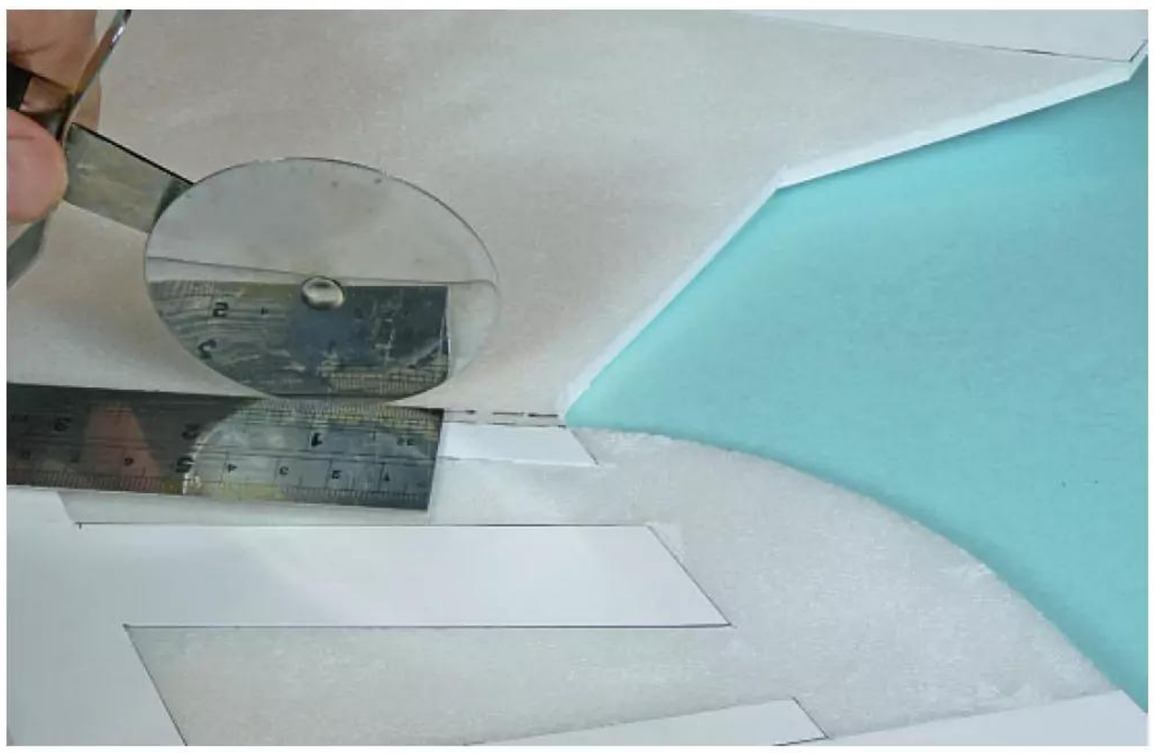
St8us is made entirely from foamboard and brown paper. There is no wood or other traditional modelling materials involved. A 50 mm 4-Max PowerFun 3S 5400 kV EDF, 50A ESC and 3S 1800 mAh LiPo provides the oomph.

Foamboard is a great material to build with but there are a few things to bear in mind:



Card is removed from the foamboard during construction. Easily done with the Westfoam product with a heated iron set to 140 - 160° to soften the glue and remove sections of card. The 6mm stuff needs to be soaked with water and rubbed off.

Removing the card shaves 25 g from each wing blank so it's a worthwhile exercise!



Use a straight edge and pizza cutter to form a crease where the LE fold will be.

- Make sure the building board is kept meticulous clean as any debris will damage the surface of the Foamboard.
- Make sure your blade is sharp as they go blunt surprisingly quickly. You'll need a good supply of fresh blades or a sharpening stone to keep a few blades nice and sharp.
- Always make sure the blade is at 90° to the Foamboard when cutting out as the finished surface is occasionally on the opposite side to the cut.
- Foamboard is very easy to sand - too easy - so be careful! I find a few strokes with the rough side of a Permagrit block, followed by some 180 grit sandpaper to finish works best.
- Most foam safe glues work well with foamboard but key the surface of the card and foam first to take the shine off. My favourites glues to use are Gorilla Glue Clear and UHU POR for general joints and Gorilla Glue Original where the expanding properties can be utilised.

NOT ALL FOAMBOARDS ARE EQUAL

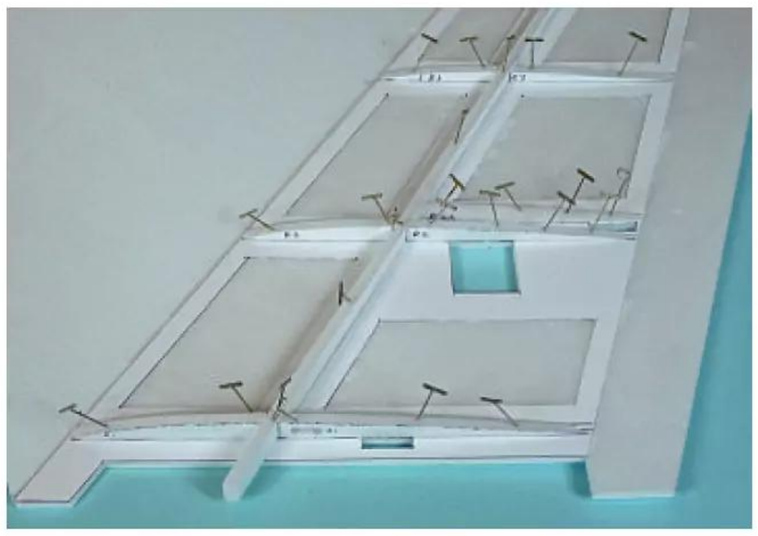
The St8us design was based on 5 mm foamboard with a trade name 'Westfoam' readily available from Hobbycraft. It's great for modelling as the card can be removed with a hot iron to save weight and increase the versatility of the product. Just prior to the planned publication of this St8us article in RCM&E Hobbycraft changed supplier and the new stuff isn't as good. It's slightly thicker at 6 mm (the plan has been revised to cater for this) but sadly heat doesn't remove the card. Water needs to be applied and the card rubbed off with a fingertip. It's a little messy and time consuming but doable if you can't get hold of Westfoam foamboard. If using water, try to keep it away from areas where the card is to remain and leave to fully dry before moving on to the next stage. Alternatively, if you don't mind covering a model you could use 5 mm Vitrex underlay and cover it with brown paper or iron on film. Some parts of the model use salvaged card from the foamboard. If you had to wash the card off use 120–150 gsm card/paper where required. Apply a thin coat of Deluxe Materials Covergrip for bonding them together.

As the construction is quite unorthodox what follows is a step by step set of instructions which probably took longer to write than it will take to build the actual model! Some of the photos are from earlier versions so may not perfectly match the plan but will show the intent. St8us needs 3 x A1 sheets of foamboard and there'll be plenty of bits left over to practice on!

I've also started a thread on the RCM&E forum at **www.modelflying.co.uk** with more photos and explanations, and where I'll also try to answer any questions that may arise.

WINGS

We start with the right-hand wing panel shown on the plan.



Card on the wing tip side of each rib is removed. Gorilla Glue Clear is great for gluing the spar and ribs to the bottom skin.

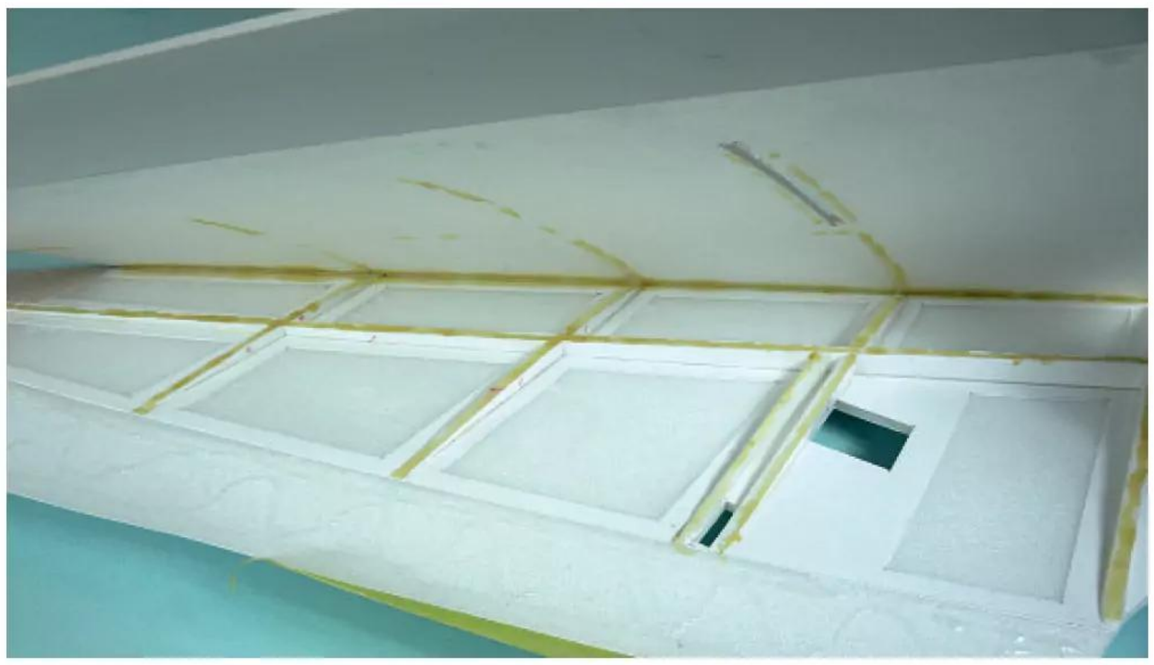
Tape the plan onto the foamboard and prick through with a pin to locate all the salient points. With constant reference to the plan, join up all the pin holes to give you an outline, cut lines and rib/spar locations.

Cut the openings for the servo access and slots in the top and bottom skin for the fin. Note the fin slot in the top skin is undersized to cater for both thicknesses of foamboard and is opened later when the wing is folded up and glued. Cut out the outline and carefully cut through just the card where sections of card are to be removed.

The next step depends on which foamboard you're using...

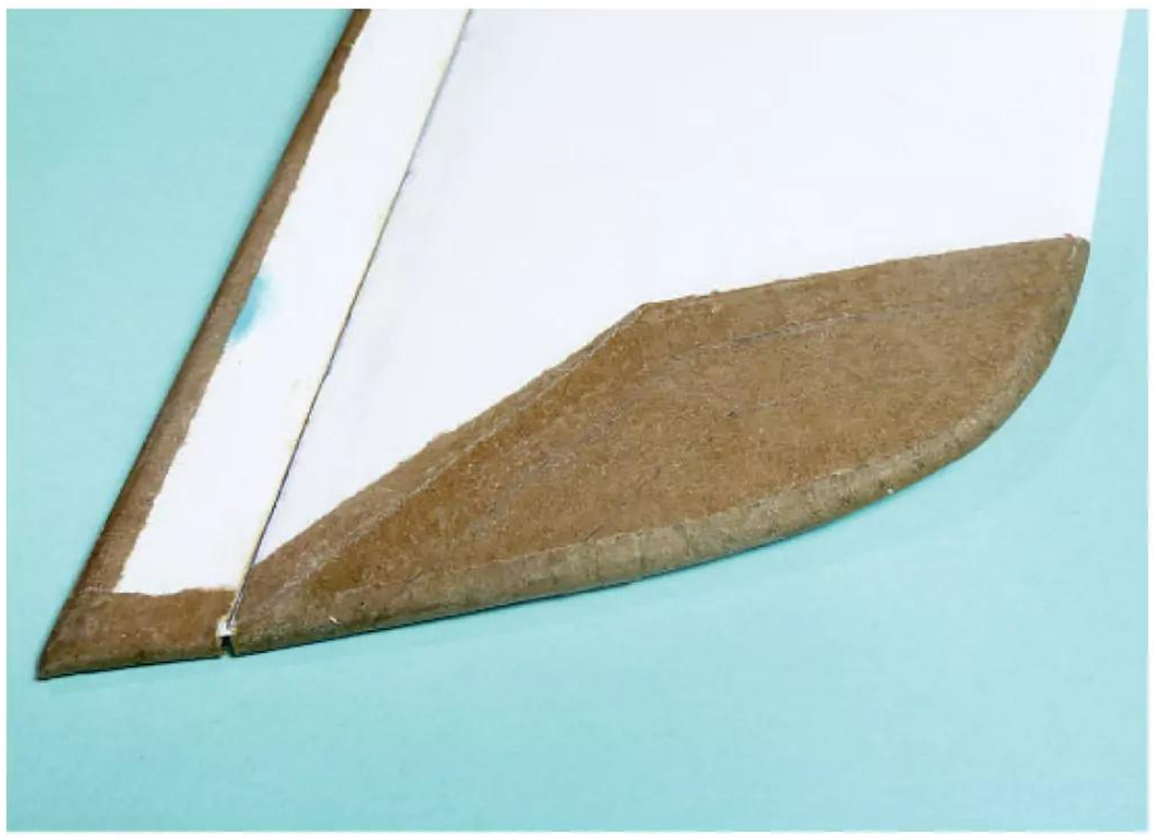
If you've got the heat sensitive stuff set your film iron to approx. 160°C and carefully run

Use a sharp long blade slice off a ramp at the TE of the bottom skin to form the gluing area for the top skin when folded over. Then use the rough side of a Permagrit sanding block to remove any high spots.



Apply glue to the rib tops, spar and the TE slope on the bottom skin ready for folding. Make sure no glue gets into the slot between R2 and R2a.

A taper is carved into the bottom skin ready for the wing tip upper. Sand smooth before gluing the upper in place. Sand the upper to shape when dry.



All exposed foam at the tip and the elevon TE is covered with brown paper and diluted aliphatic resin (70% glue/30% water).

the iron over the sections of card to be removed and peel off the card. It takes a bit of practice but once mastered is quite quick. Use some offcuts to practice on if preferred. This is a worthwhile exercise as it shaves about 25 g off the weight of each panel.

If you've got the non-heat sensitive stuff roughen the surface of the card to be removed with sandpaper and brush plain water onto the surface. Leave for a few minutes to soak in and then rub the surface with a fingertip until the top surface comes away, then the rest of the card will easily rub off. Leave to thoroughly dry before moving on.

Mark a line 3 mm in front of the bottom sheet card LE and using a straight edge and a pizza cutter form a crease in the foam to help the LE form as the top skin is folded over. Go back and forth several times to make a deep crease. Practice on some scrap foamboard first to establish how much pressure to apply. When the top skin is folded over, weigh it down for a while to allow the foam at the LE to 'give' and allow the fold to become permanent.

Cut out the ribs and remove the card on the wing tip side of each rib. Chamfer the LE of the ribs and at the spar location to accommodate the wing sweep. Cut out the spar and chamfer the root. Glue and pin the spar to the lower skin.

Glue all the ribs in place making sure they are vertical, especially R2 and R2a which form the slot where the fin will be located. Use a scrap of foamboard and two pieces of card as a spacer (the slot will be lined with card later) to make sure the gap between R2 and R2a is wide enough. The spacing isn't super critical as the slot can be shimmed later but it's good to get it as close as possible. Pin and weigh the bottom skin assembly onto a flat surface while the glue dries.

Sand the top of the ribs in front of the spar on the wing tip side to cater for the wing sweep and improve the gluing area. Take care not to sand any of the root side card away as this will maintain the correct profile.

Carefully slice and sand a taper to the TE of the bottom skin. This will form the gluing area for the top skin when folded over.

Form the elevon hinge by cutting through the foam on the inside of the top skin at the hinge line, being careful not to cut into the card on the outside.

Apply Gorilla Glue Original down the LE crease in the foam, along the top of the spar and the ribs, making sure that none gets into the slot between R2 and R2a. Also smear Gorilla Glue Clear over the exposed foam area of the bottom sheet TE. Fold the top sheet over, lay the wing panel onto a flat surface and place a heavy weight over the spar line. I made a weight from a cardboard box filled with sand which worked fine.

Next, fold the elevon back onto the top of the wing and add lots more weight over the top of the wing using scraps of foamboard or strips of wood underneath to spread the load. The idea is to get the top skin in contact with the spar, ribs and the bottom sheet at the TE. Leave to dry overnight. When removed the wing panel should feel strong and torsionally rigid.

Using the reverse of the plan use the pin prick holes to mark the outline and locations for the left wing. Repeat the whole process for the left wing.

Cut out the wing tip uppers and remove the card from both sides. Slice off and sand a slope on the bottom sheet tips as shown on the plan and glue the uppers in place, making sure the edges stand slightly proud as they join the top skin. A small strip of foam is also required on the underside at the LE tip to fill the gap formed during the folding. Sand and blend in the tips to a pleasing shape and round off the TE of the elevons.

Seal the exposed edges of foam and wing tips with a layer of brown paper and thinned aliphatic glue. A 70% glue to 30% water worked well for me.

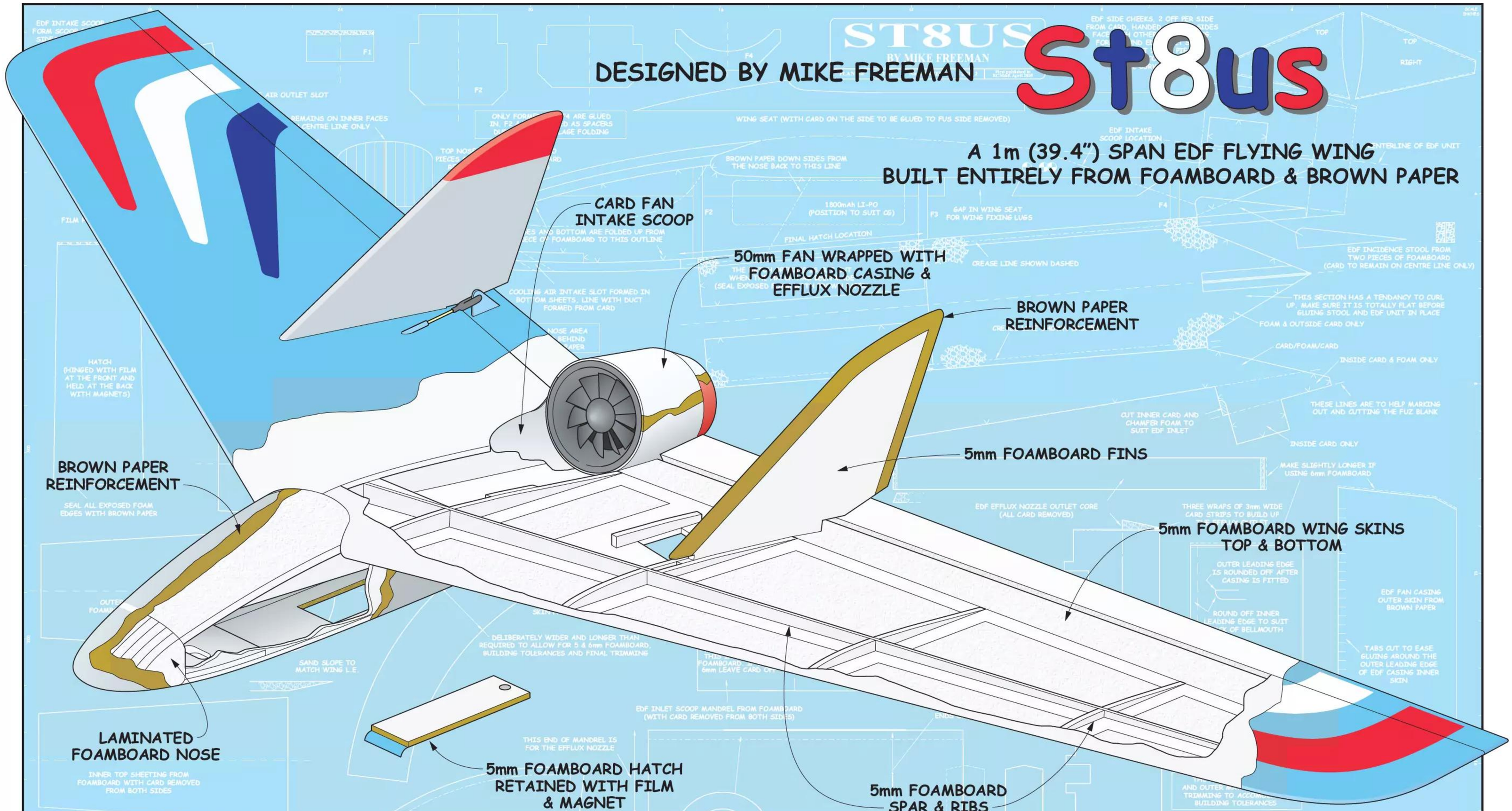
FINS

Cut out the two fins, round off the edges and seal with brown paper and thinned glue. Open the slots in the top of the wings for the fins and check they are perpendicular to the top of the wings. Line the slots with card. Add shims to fill any gaps and/or to straighten the fins up. When dry trim off any excess card so the

DESIGNED BY MIKE FREEMAN

St8us

A 1m (39.4") SPAN EDF FLYING WING
BUILT ENTIRELY FROM FOAMBOARD & BROWN PAPER



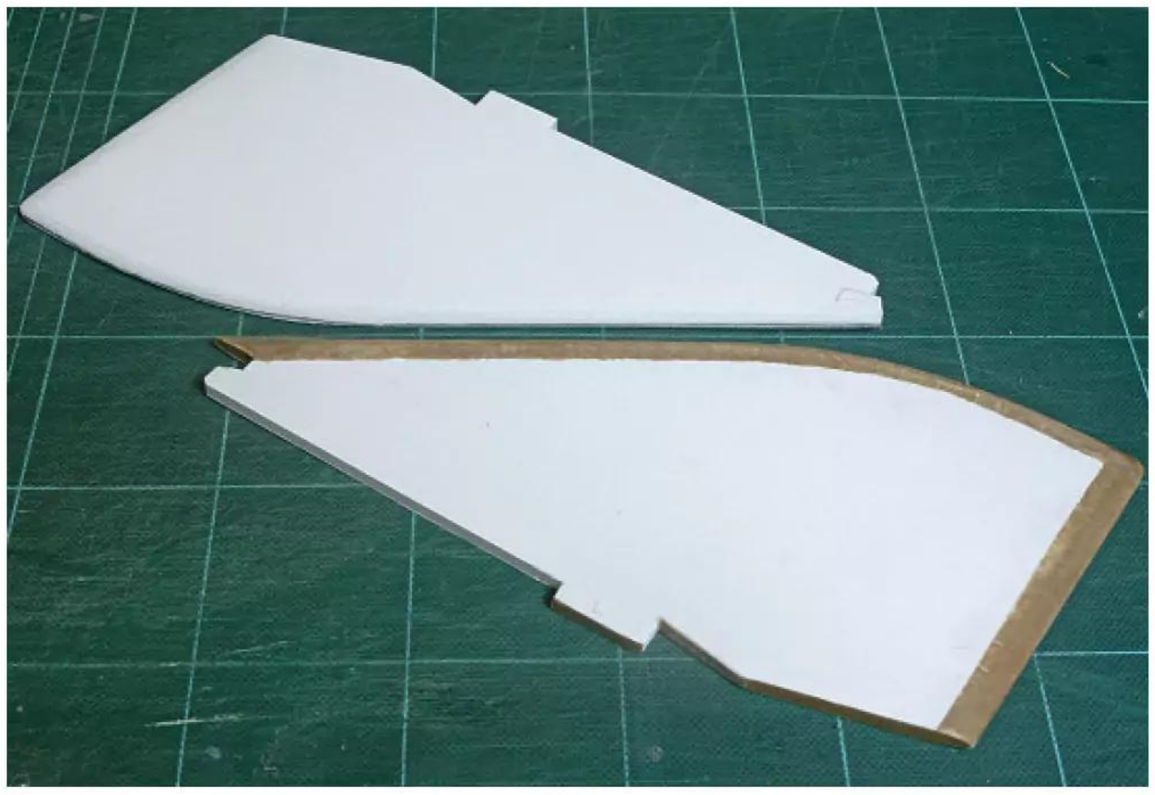
DATA FILE	
NAME:	ST8US
MODEL TYPE:	EDF POWERED FLYING WING
WING SPAN:	1000mm (39.4in)
WING AREA:	0.22m² (341in²)
FUZ LENGTH:	510mm (20.1in)
FLYING WEIGHT:	615g (21.7oz)
WING LOADING:	28g/dm² (9.2oz/ft²)
FUNCTIONS:	ELEVONS (2), THROTTLE - ESC (1)

RECOMMENDED POWERTRAIN	
EDF UNIT:	4-MAX 50mm POWERFUN 3S 5400kV
ESC:	4-MAX 50A SWITCH MODE BEC (4M-HESC 50AV2)
BATTERY:	4-MAX 1800mAh 3S LI-PO
PEAK POWER:	440W (325W/lb)

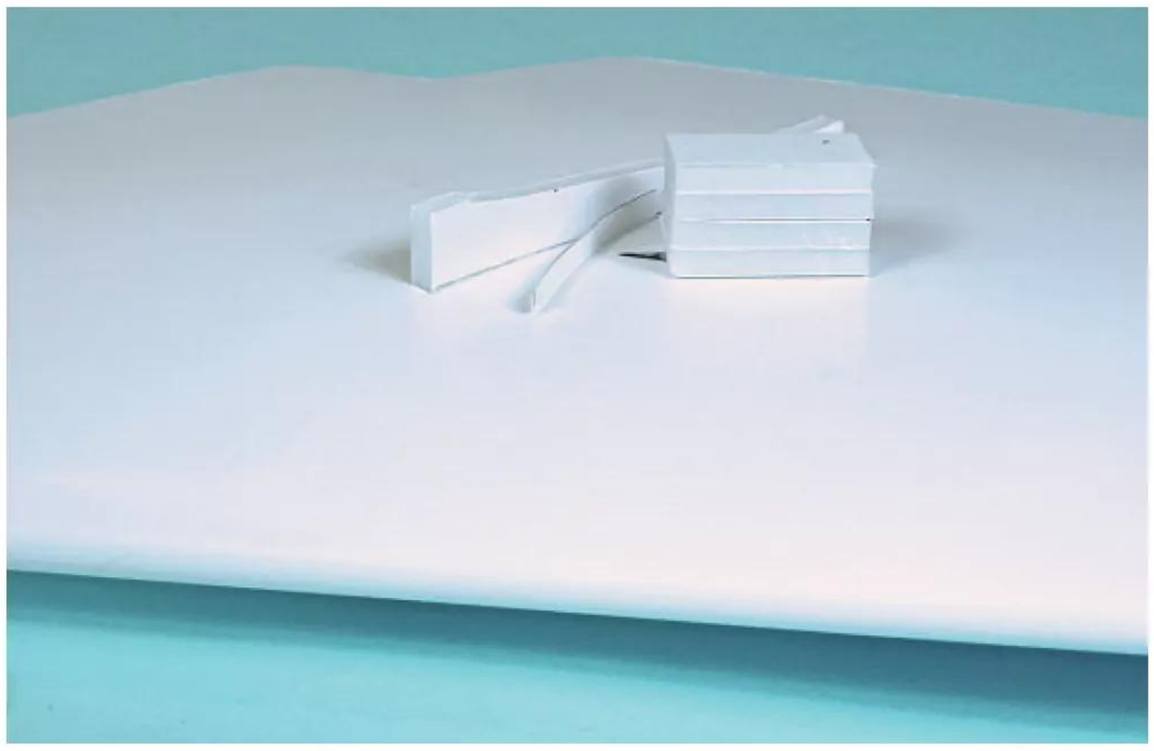
NOTES

1. THIS MODEL IS BUILT ENTIRELY FROM FOAMBOARD AND BROWN PAPER
2. UNLESS STATED OTHERWISE ALL REFERENCE TO 'CARD' MEANS THE CARD REMOVED FROM FOAMBOARD DURING CONSTRUCTION
3. ALL BROWN PAPER IS APPLIED WITH ALPHATIC RESIN OR SANDABLE PVA THINNED TO 70% CONSISTANCY

TARGET FLYING WEIGHT
WITH 1800mAh 3S LI-PO: 615g (21.7oz)



Edges of the fins are rounded off and the exposed foam covered with brown paper and thinned glue.



This special tool is required at several stages of the construction so keep it safe! The blade must be 20mm off the board. Here the tool is being used to trim the card linings of each fin back level with the top of the wings.

slots are flush with the top of the wings. I made a special tool for this as shown in the photos. Keep the tool as we use it again on the fuselage. Reinforce around the slots with brown paper and thinned glue.

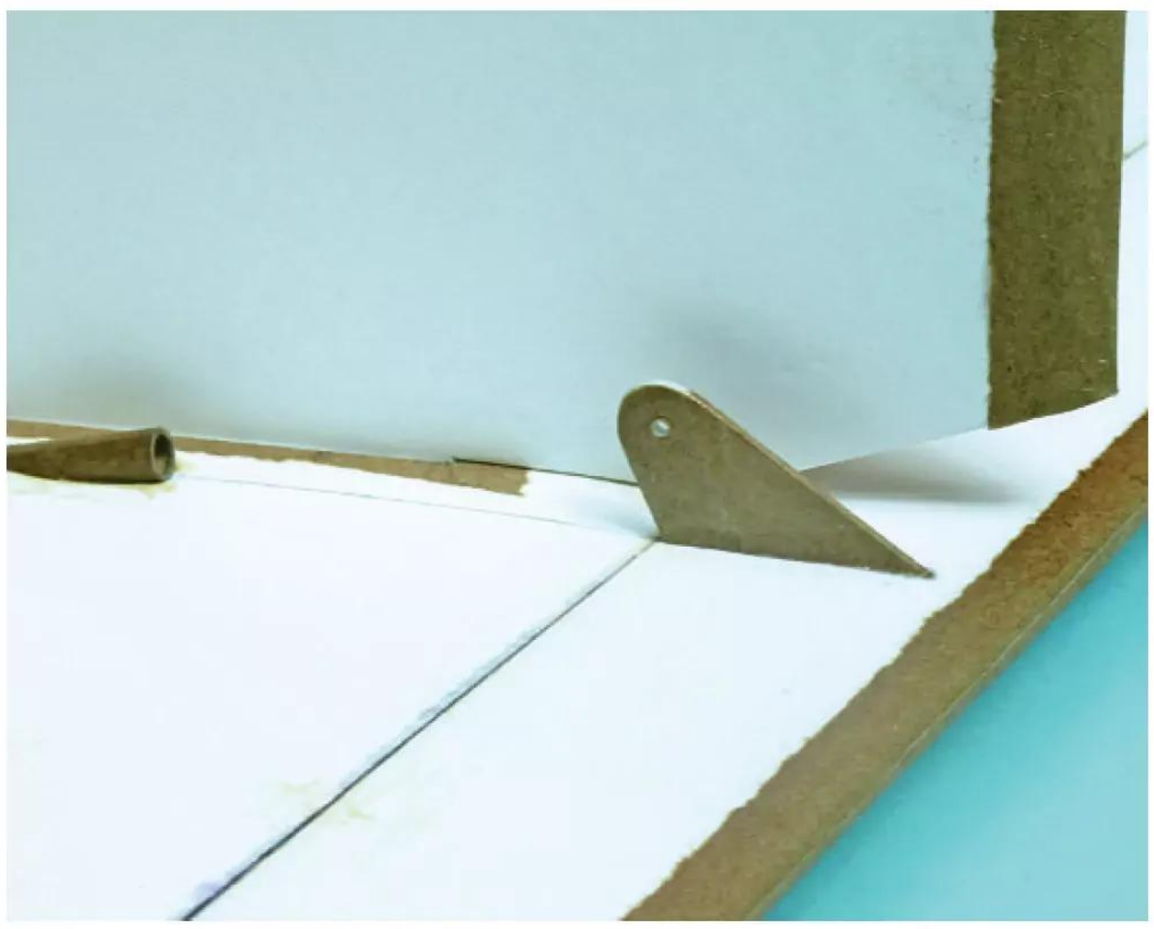
JOIN THE WINGS

Cut out the servo frames to suit your chosen servos and glue in place. Establish the dimension 'a' on the drawing and using a brass tube or similar with a sharpened end 'drill' the pushrod exits in the top skin. Sleeve the holes with some rolled up brown paper tubes. Make the elevon horns from five pieces of card glued together and wrapped in brown paper.

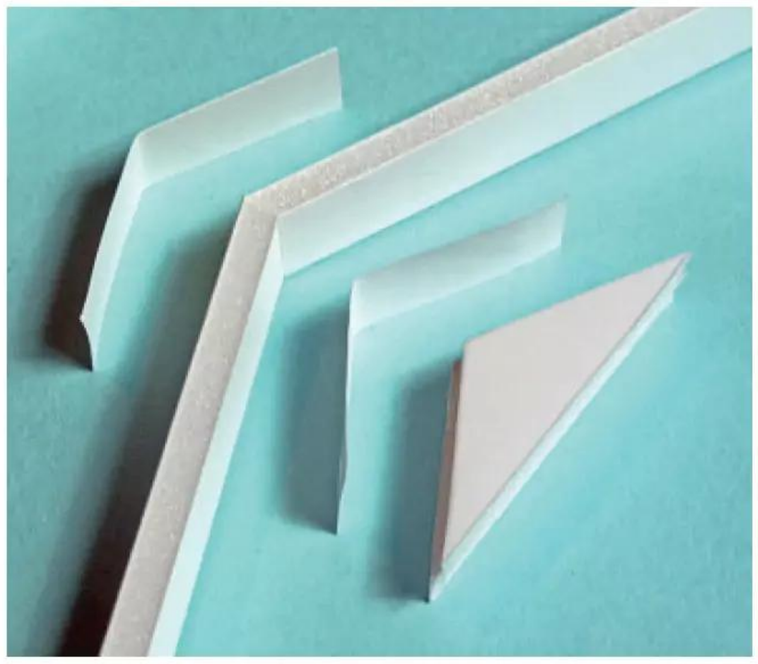
With the wing tip propped up 15mm off the building board sand the edge of the top skin at the root so the wing root is at 90° to the building board. Mark the edge of the bottom skin with felt pen to ensure it isn't inadvertently sanded. Sand a small chamfer on the elevon LE to increase the down movement but be careful not to sand the top skin card as this forms the hinge. Seal the exposed foam with film.

Tape the bottom skins together at the root, open the gap and apply Gorilla Glue Clear to all the joining surfaces of the top and bottom skins and the spar. Prop the tips up 15mm under each tip as the glue dries and make sure the top surfaces of the wings line up at the root. Once

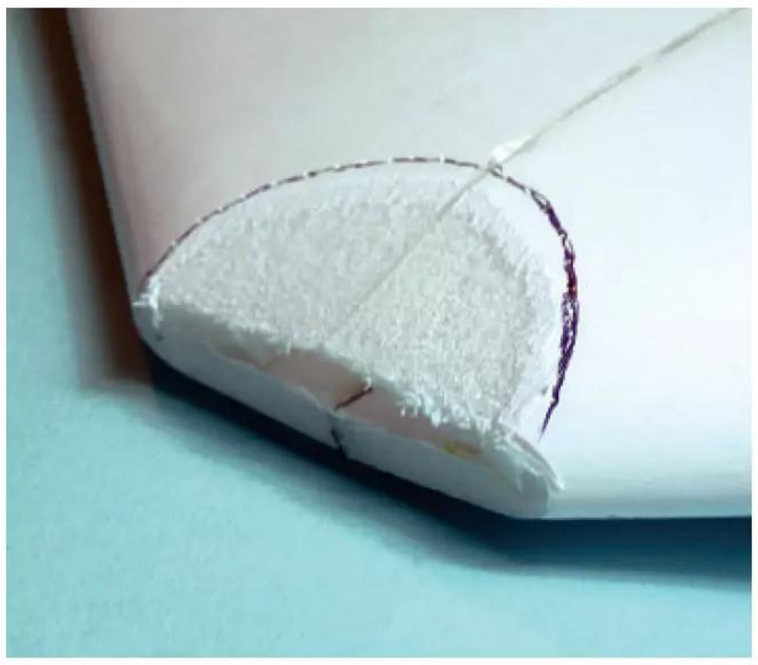
Make up the servo frames from foamboard to suit your servos. Glue the frames in place and dry fit the servo to establish the pushrod exit slot location in the top skin.



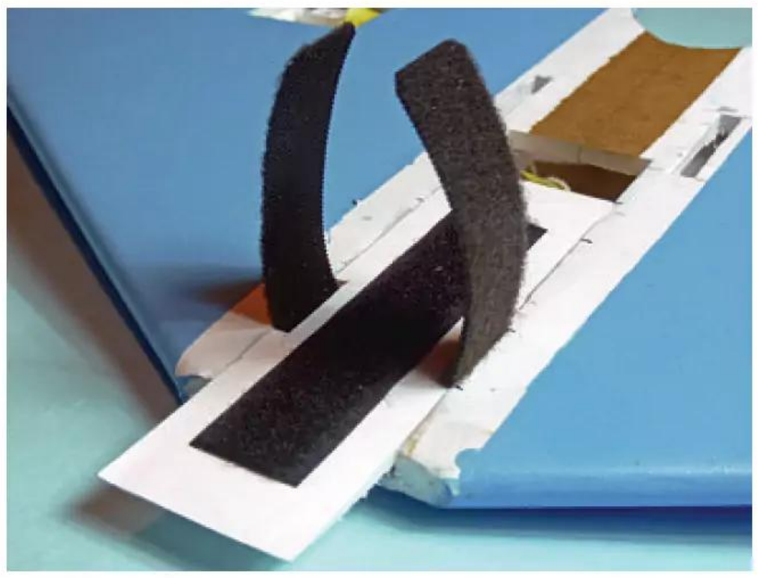
Make up the elevon control horns from card, brown paper and thinned glue. Or use ply if preferred!



Exploded view of the dihedral brace.

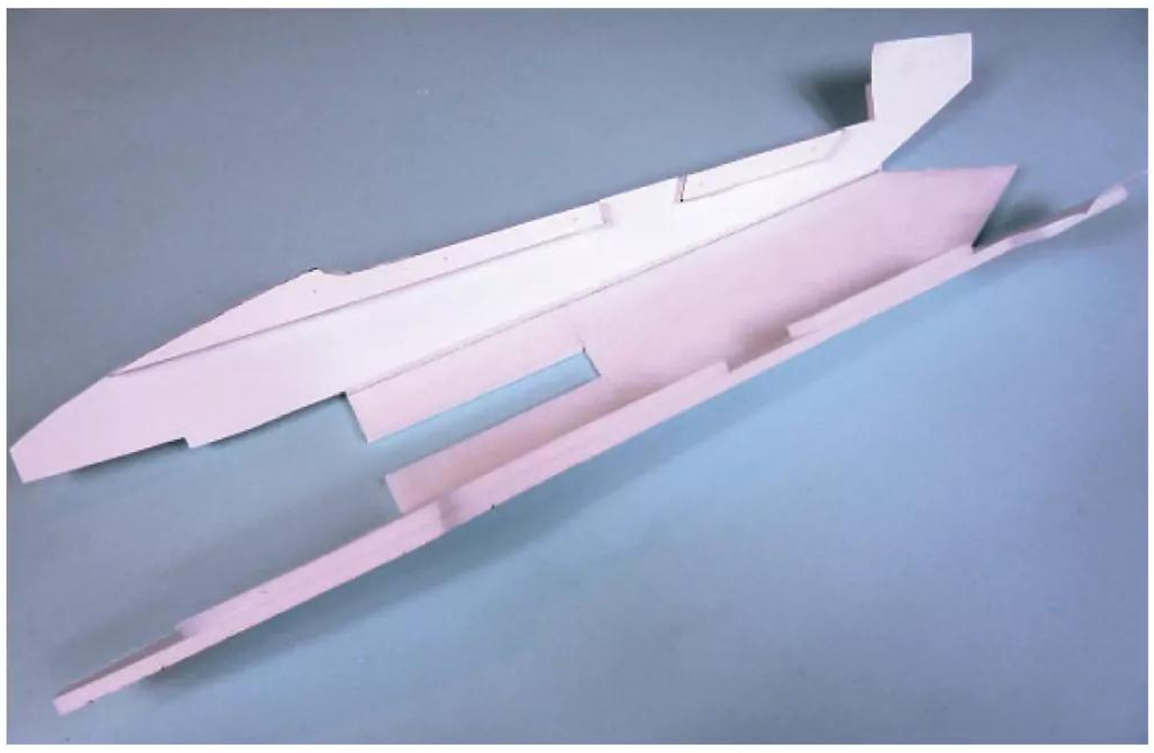


The nose of the joined wings is cut off.



Components for the battery floor. Note the brown paper wing join reinforcement across the top wing skin joint.

Card is removed from the inside of the fuselage bottom and creases formed for folding the fuselage sides up.



Wing seats are added. Remember to leave the gap for the wing fixing lugs.

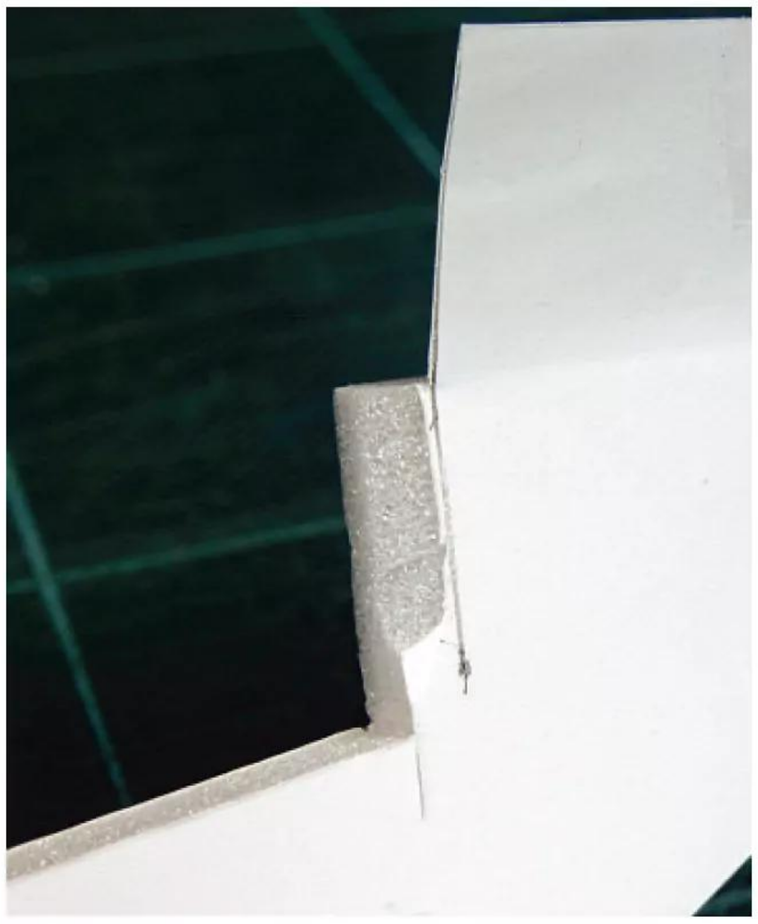
dry add the dihedral brace as shown on the plan and photos and add the brown paper wing join reinforcement. Cut off the root LE and sand the top surface flat as shown on the plan. Remove the bottom sheet forward of the spar and add the internal brown paper reinforcement at the wing join.

The battery floor is made up of two pieces of foamboard. First fit Part A and the Velcro retention strap. These slide in behind the bottom skins. The front edges might need trimming to accept the curvature and taper at the LE. Finally, add the battery floor. This should be flush with the underside of the wings at the spar and stand slightly proud at the LE thanks to the slight upsweep of the bottom skin.

FUSELAGE

Start by marking the outline of the fuselage blank onto the foamboard using a pin as you did with the wings and cut out. The surface you are looking at will be the OUTSIDE skin of the fuselage so turn it over and write INSIDE in several places to avoid any confusion. Turn the blank over again so the outside is uppermost and position over the plan. Using the extension lines on the plan as guides cut away the sections of outer card and foam that need to be removed at the EDF location. Turn the blank over so the inside is uppermost and again lay the blank over the plan. Using the extension lines as guides mark and remove the card from the fuselage bottom. With the inside still uppermost mark and score the two crease lines between the bottom and the sides. Use a straight edge and a pizza cutter as before. A deeper crease is beneficial here. Add the wing seats, two pieces per side, with a slot between for the wing fixing lugs.

Cut out the formers. Run Gorilla Clear Glue along the creases in the fuselage blank and fold the sides up with the formers trapped in place. Note: only F1is glued in place at this stage. The others are just used as spacers for now. I used my SLEC building jig to hold the sides vertical while the glue dries. Some weights on top of the wing seat will help the fold in the hatch area to stay in place as the glue dries. Put some scrap foamboard in front of the hatch area to prevent the fold from being over flattened. When dry, remove from the jig and the fuselage should keep its sides at 90° to the bottom. Leave the formers in place for now. Dry fit the wing and



Don't forget this chamfer in the foam to accommodate the inside curve of the EDF bell-mouth.

trim the wing seats at the LE so the wings sit properly on the wing seats.

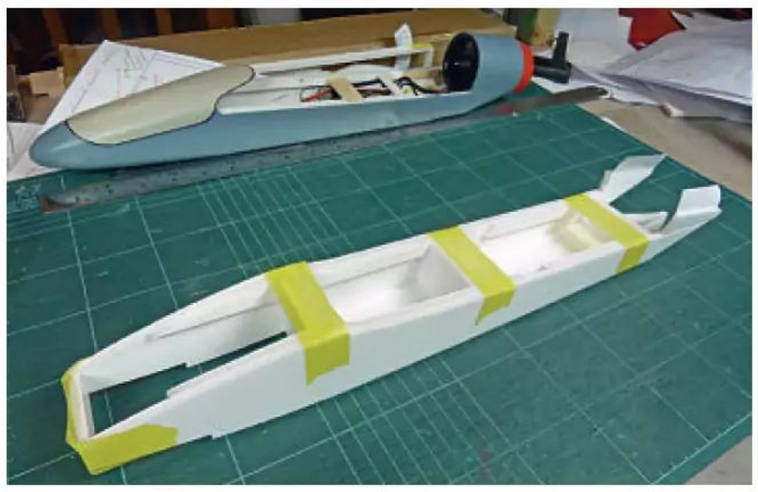
Cut out and glue in place the top and bottom sheeting to the nose, remembering to include the air intake duct in the underside of the nose. Dry fit the wing to make sure the slope of the top sheet matches the sanded wing LE area.

Sand the front of the fuselage flush with F1, make up the nose block and glue in place. Sand the whole nose area to a pleasing shape, making sure the top sheet blends in nicely with the wings upper surface. Seal the exposed foam with strips of brown paper and thinned glue. I also added brown paper to the fuselage sides to behind the wing LE to strengthen the nose.

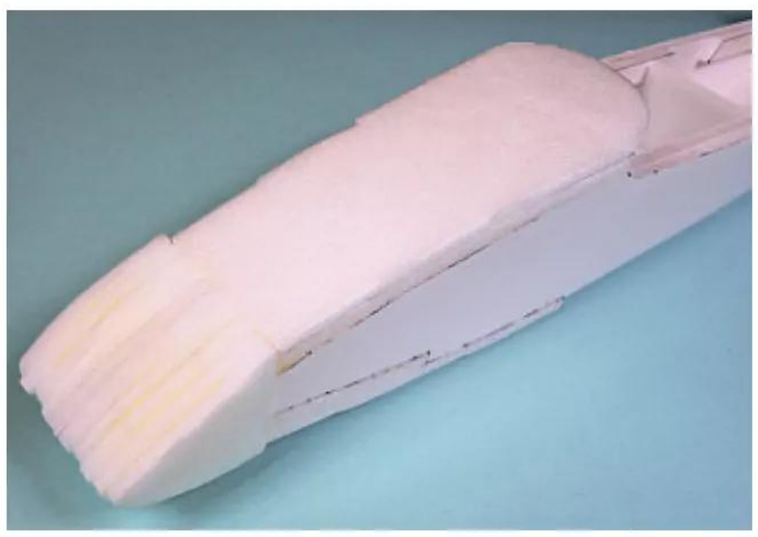
Make up the hatch and cut an opening in the underside of the fuselage to suit. Line the edges of the hatch and opening with brown paper. A film hinge at the front locates the hatch and a magnet at the rear holds it closed.

EDF MANDREL

Make up the EDF mandrel. The only critical part is ensuring the EDF efflux tube is the exact diameter required. See plan and photos for details. Cut out the foam EDF fan casing inner skin and gently form a curve to it. Gently pull the casing over the edge of a kitchen worktop and slowly increase the



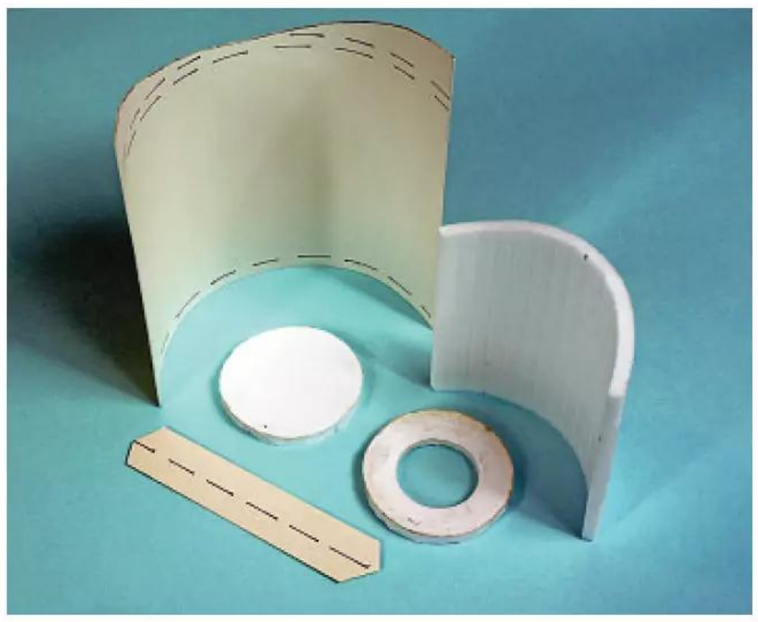
Tape holds the fuselage sides together, trapping the formers in place while the glue in the creases dries. On another prototype I put the folded fuselage in a SLEC building jig instead of using tape.



Nose block is made up from 10 pieces of foamboard with the card removed from all sides except on the centreline.

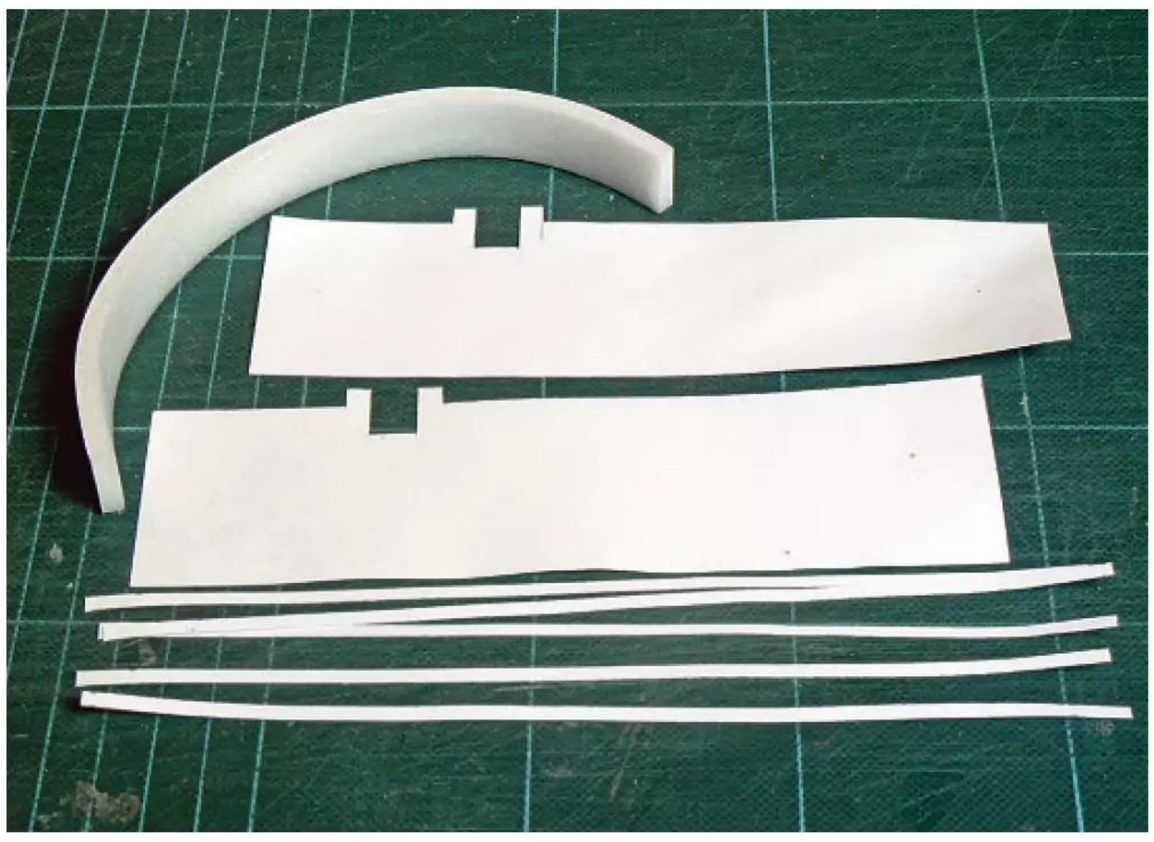
After sanding the nose to shape all exposed foam is covered with brown paper and thinned glue. Thin strips help with the curvature. I also added brown paper down the sides of the nose for additional strength.

curvature. Take your time; go too quick and it'll crease or crack! Wrap it around a suitable tube to force a curve slightly tighter than the EDF unit. Leave for a while until the curve sets. Build up the EDF efflux nozzle from

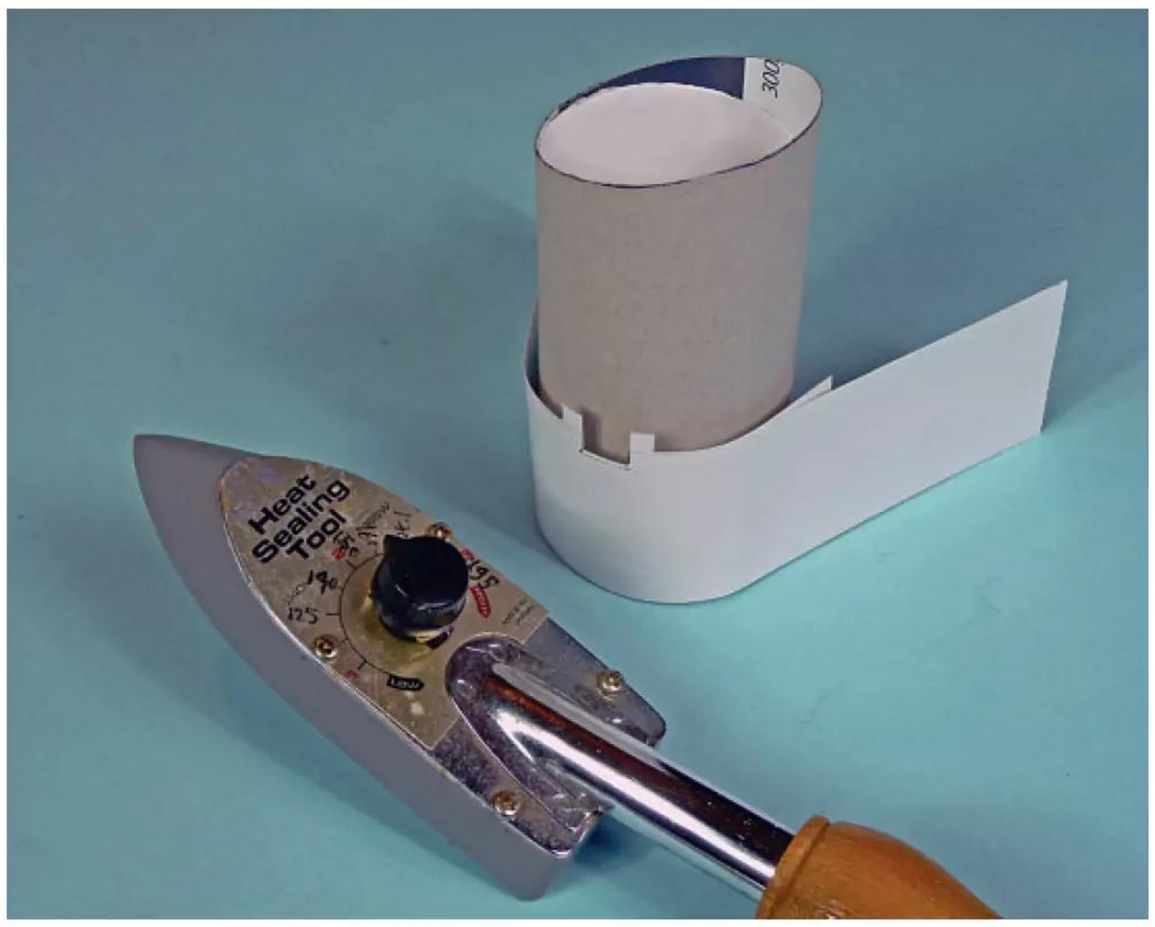


Sequence of m aking the EDF mandrel cylinder.

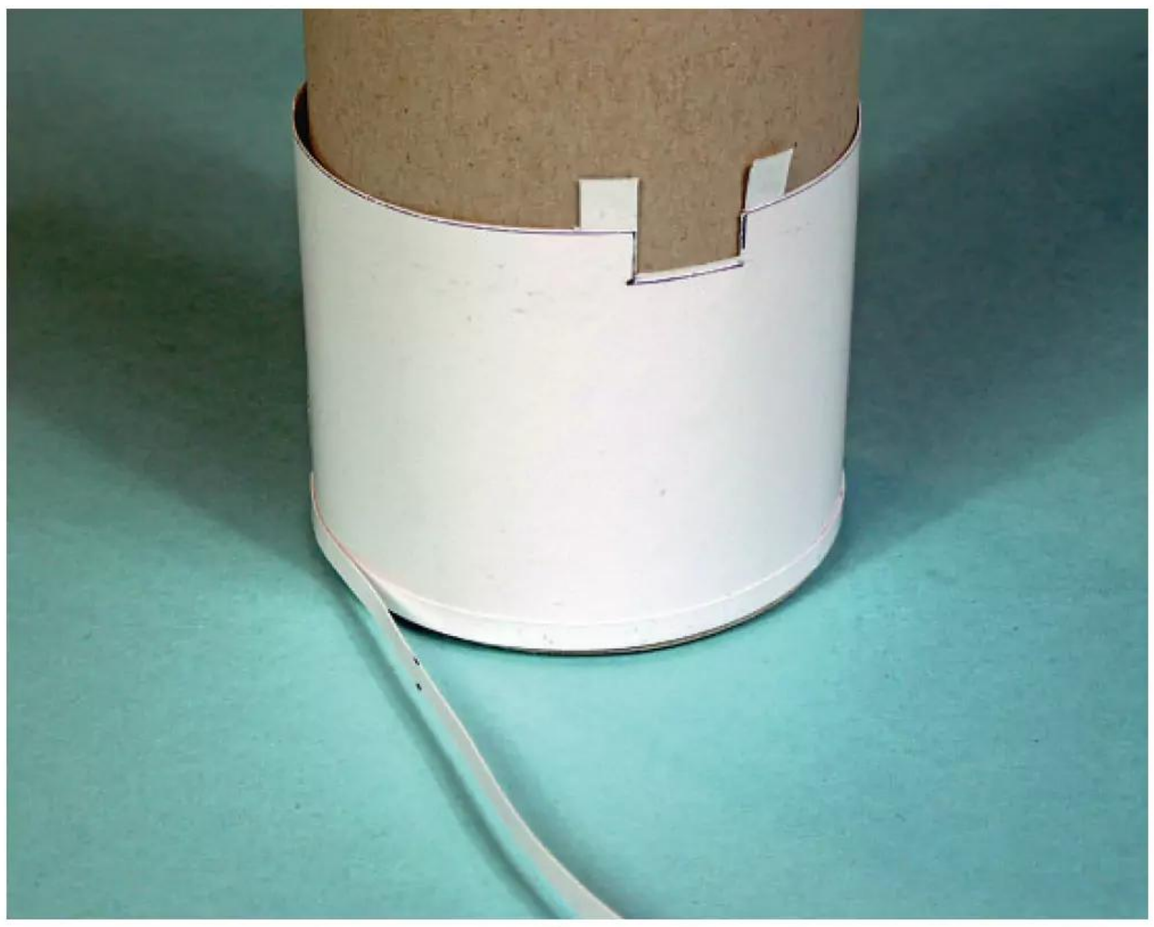
Make sure the ends of the first wrap of the EDF efflux tube blank just meet when wrapped around the mandrel. If they overlap add extra layers of paper around the mandrel to increase the diameter until the ends just meet.



Components used to make the EDF efflux tube.



To make the EDF efflux tube first join the two blanks together by using heat from your film iron to activate the glue. Wrap the efflux tube blanks around the mandrel and use heat to form the tube.

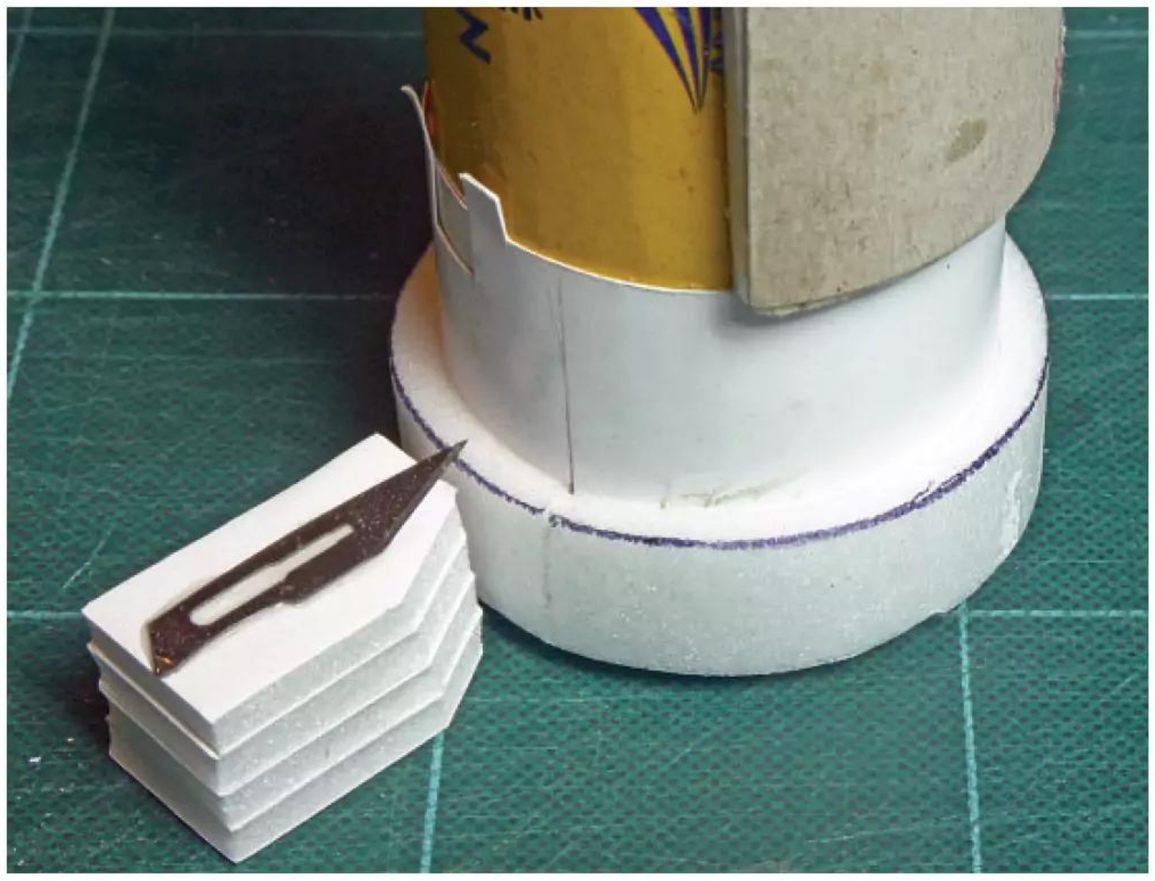


Cut 3mm wide strips of card and the efflux nozzle outlet core from foam. Add three wraps of the 3mm wide strips around the outlet making sure they are all flush with the outlet.

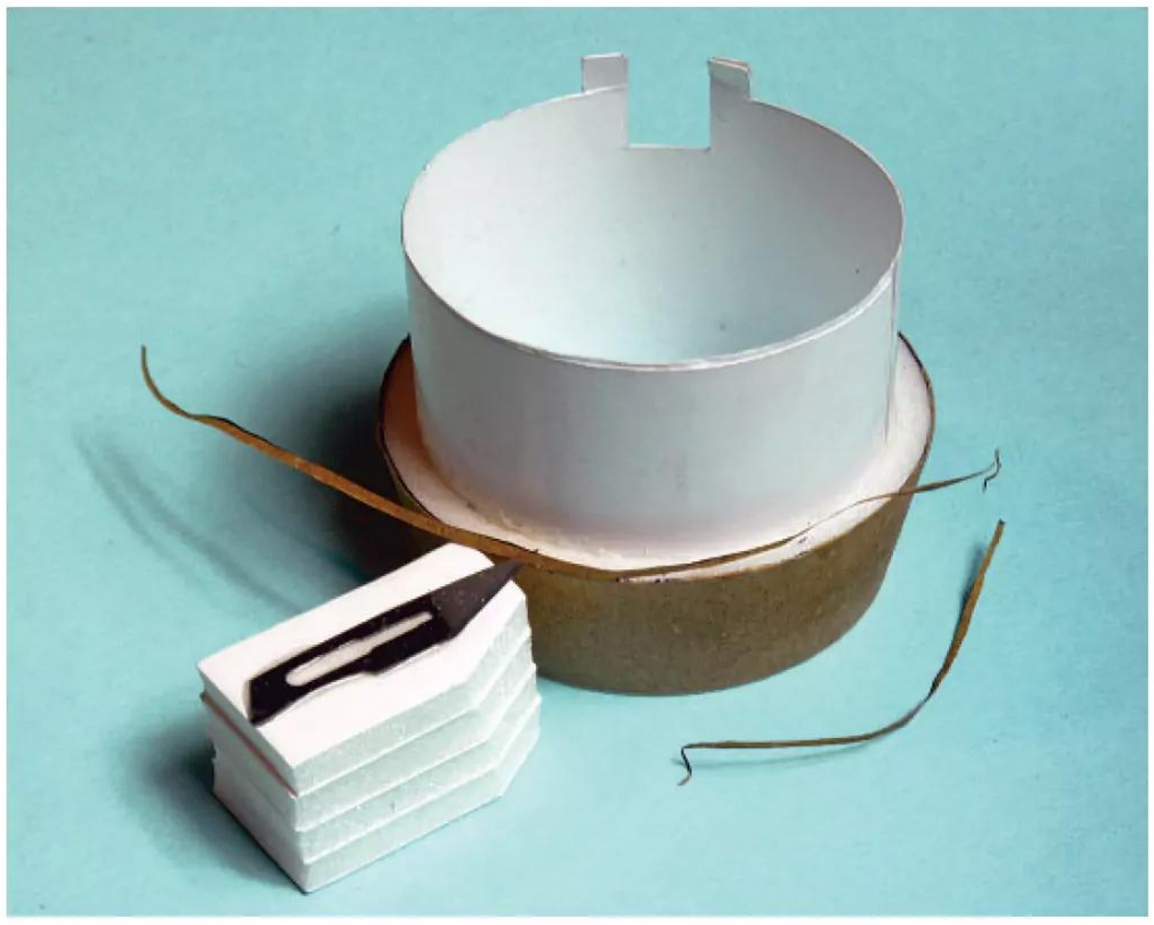
card, foam and brown paper. See plan and photos for details. Make sure the fuselage bottom is flat at the rear and glue the EDF stool in place. Glue the EDF unit onto the stool and glue the card of the fuselage sides onto the sides of the EDF unit. Check against the plan that the right amount of up-thrust is present. Slide the EDF efflux nozzle onto the mandrel and glue the nozzle to the stool and the fuselage sides, making sure it is tight against the outlet of the EDF unit all the way round. The notch allows the wires to pass through. Add a strip of brown paper over the joint for alignment and additional strength and leave to dry. Double check the up thrust. Hopefully the foam EDF fan casing inner skin now has a tight curve and can be glued in place. Chamfer the ends to blend in with the fuselage sides. The EDF mandrel can be withdrawn when the glue has dried. Sand off any high spots where it meets the fuselage sides and sand a rounded edge to the LE at the EDF inlet.

Add the brown paper EDF casing outer skin with thinned glue. All being well there should be no step where the over EDF skin and efflux outlet meet. If there is a step add further layers of brown paper to build the levels up.

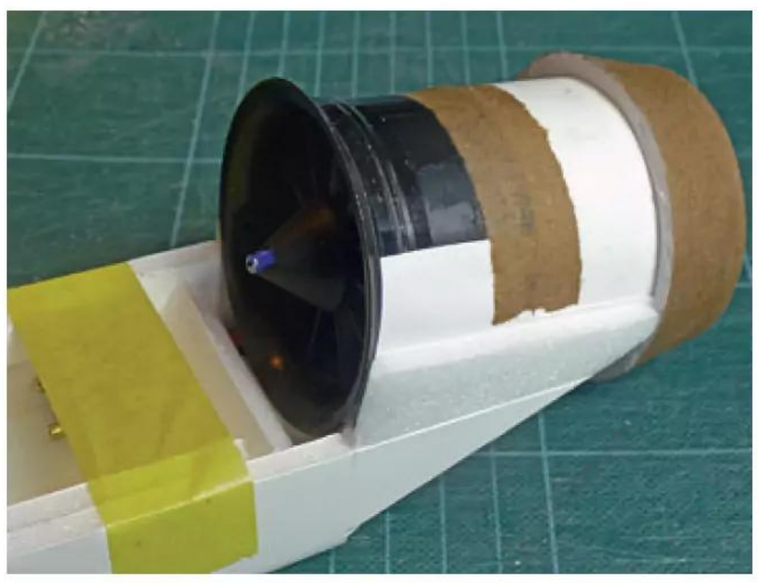
Line the EDF side cheek openings with scraps of foam. Form the side cheeks from two pieces



Glue the outlet core onto the efflux tube making sure it is tight against the 3mm wide strips. Use the special tool to ensure the efflux nozzle outlet core is the correct width. Note the black Sharpie line around the rim. Use this as a guide when sanding the taper.

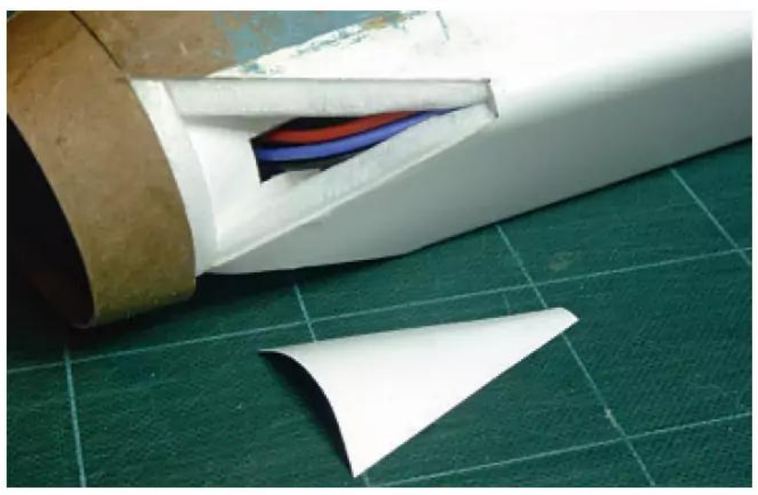


Add the efflux nozzle external skin and when fully dried trim the outlet so it's flush with the efflux tube opening. Use the special tool made earlier to trim the excess brown paper from the edge of the efflux nozzle outlet core.



Completed EDF efflux nozzle is glued in place. Make sure it is touching the rear of the EDF casing all the way round and check the up thrust is correct against the plan. Note the brown paper strip across the EDF unit and efflux tube joint.

EDF casing inner skin is then added and once dry the LE of it can be rounded off. The brown paper outer skin can now be added and trimmed when dry.



EDF cheeks are made from two pieces of card with glue sides together and heated whilst held on the mandrel to form the curve.

In the next issue Mike finishes off the EDF powered St8us and shows how to set her up for some sparkling sport performance.

of card with the glue sides together using the mandrel and heat from a film iron to set the curve. Make sure you make a handed pair! Glue the side cheeks in place making sure they are flush with the fuselage sides, bottom and the efflux nozzle. These might need a little trimming to accommodate building tolerances.

To be continued in the May issue. ■

Scan this QR code, or visit the link shown, for construction shots and views of St8us: https://www.youtube.com/watch?v=oZ2oiWpjeaU

DATAFILE

Name:	St8us
Model type:	EDF flying wing
Designed by:	Mike Freeman
Wingspan:	1000 mm (39.4")
Wing area:	0.22 m² (341 in²)
Fuselage length:	510 mm (20.1")
Flying weight:	615 g (21.7 oz)
Wing loading:	28 g/dm² (9.2 oz/ft²)
Functions:	Elevons (2), throttle (ESC)
EDF Unit:	4-Max 50mm PowerFun 3S 5400 kV
ESC:	4-Max 50A Switch Mode BEC (4M-HESC 50AV2)
Battery:	3S 1800 mAh LiPo
Peak power:	440 W (325 W/lb)

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50mm	PowerFun 4300kv (4S LiPo)	765g	£37.79
50mm	FMS 4500kv (4S LiPo)	1,086g	£41.58
64mm	PowerFun 3900kv (3S LiPo)	872g	£39.20
64mm	FMS 3900kv (3S LiPo)	TBA	£53.99
64mm	PowerFun 3500kv (4S LiPo)	1,072g	£39.20
64mm	FMS 3150kv (4S LiPo)	1,162g	£53.99
70mm	FMS 2750kv (4S LiPo)	1,253g	£70.20
70mm	PowerFun 3400kv (4S LiPo)	1,435g	£47.50
70mm	PowerFun 2300kv (6S LiPo)	1,816g	£53.49
70mm	FMS 1900kv (6S LiPo)	TBA	£75.59
80mm	V3 FMS 2000kv (6S LiPo)	TBA	£129.99
90mm	PowerFun 1450kv (6S LiPo)	2,924g	£95.00
90mm	FMS 1850kv (6S LiPo Metal Case, Inrunner)	4,000g	£172.99
90mm	PowerFun 1100kv (8S LiPo)	3,360g	£95.00
90mm	FMS 1500kv (8S LiPo Metal Case, Inrunner)	4,800g	£183.59

Complete Electrical Setup For The ST8US by Mike Freeman

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Make	Part Number	Type	Weight	Torque / Speed	Description	Price
EMAX	ES9251 II	Sub Micro	4.0g	0.27Kg @ 4.8V - 0.08sec/60°	Digital, Light Weight, High Speed	1pcs £8.79ea 5pcs £7.91ea
4-Max	4M-037AH-0045	Sub Micro	3.7g	0.45Kg @ 4.8V - 0.10sec/60° 0.55Kg @ 6.0V - 0.08sec/60°	Analog, Light Weight, High Speed	1pcs £6.84ea 5pcs £6.16ea
4-Max	4M-045DH-005	Sub Micro	4.5g	0.5Kg @ 4.8V - 0.10sec/60° 0.6Kg @ 6.0V - 0.08sec/60°	Digital, Light Weight, High Speed	1pcs £4.72ea 5pcs £4.25ea
EMAX	ES9051	Sub Micro	4.1g	0.8Kg @ 4.8V - 0.09sec/60°	Digital, High Torque, High Speed	1pcs £7.69ea 5pcs £6.92ea
4-Max	4M-056DHVMG-009	Sub Micro	5.6g	0.90Kg @ 4.8V - 0.14sec/60° 1.05Kg @ 6.0V - 0.12sec/60° 1.20Kg @ 7.4V - 0.10sec/60°	Digital, High Voltage, Metal Geared, 8mm Thick	1pcs £9.94ea 5pcs £8.95ea
New 4-Max	4M-053HVDMG-010	Sub Micro	5.3g	1.0Kg @ 4.8V - 0.09sec/60° 1.5Kg @ 6.0V - 0.08sec/60° 1.8Kg @ 7.4V - 0..07sec/60°	Digital, High Voltage, Metal Geared, 8mm Thick, High Speed	1pcs £11.10ea 5pcs £9.99ea
EMAX	ES9052MD	Sub Micro	5.5g	1.1Kg @ 4.8V - 0.11sec/60° 1.3Kg @ 6.0V - 0.09sec/60°	Digital, Metal Geared, Coreless Motor	1pcs £13.83ea 5pcs £12.45ea
4-Max	4M-094DMGB-014	Wing	9.4g	1.4Kg @ 4.8V - 0.12sec/60° 1.9Kg @ 6.0V - 0.10sec/60°	Digital, Metal Geared, Ball Raced, Wing, 8mm Thick	1pcs £11.54ea 5pcs £10.39ea
EMAX	ES08A II	Micro	8.6g	1.5Kg @ 4.8V - 0.12sec/60° 1.8Kg @ 6.0V - 0.10sec/60°	Analog, Light Weight, Great Value	1pcs £5.34ea 5pcs £4.81ea
EMAX	ES08MA II	Micro	12g	1.2Kg @ 4.8V - 0.12sec/60° 1.8Kg @ 6.0V - 0.10sec/60°	Analog, Metal Geared	1pcs £8.35ea 5pcs £7.52ea
4-Max	4M-090AH-017	Micro	9.0g	1.7Kg @ 4.8V - 0.09sec/60° 1.9Kg @ 6.0V - 0.07sec/60°	Analog, Basic 9g Servo	1pcs £3.99ea 5pcs £3.59ea
EMAX	ES3301	Micro	10.6g	2.0Kg @ 4.8V - 0.12sec/60° 2.2Kg @ 6.0V - 0.10sec/60°	Analog, Metal Geared, 9mm Thick	1pcs £8.79ea 5pcs £7.91ea
4-Max	4M-100AMG-022	Micro	10g	2.2Kg @ 4.8V - 0.12sec/60° 2.5Kg @ 6.0V - 0.10sec/60°	Analog, Metal Geared, High Torque	1pcs £7.49ea 5pcs £6.74ea
4-Max	4M-100DMG-022	Micro	10g	2.2Kg @ 4.8V - 0.12sec/60° 2.5Kg @ 6.0V - 0.10sec/60°	Digital, Metal Geared, High Torque	1pcs £9.05ea 5pcs £8.15ea
New 4-Max	4M-125HVDMG-028	Micro	12.5g	2.8Kg.cm @ 4.8V - 0.144sec/60° 3.4Kg.cm @ 6.0V - 0.111sec/60° 4.5Kg.cm @ 7.4V - 0.105sec/60°	Digital, High Voltage, Metal Geared, High Speed, Dual Ball Raced	1pcs £12.21ea 5pcs £10.99ea
New 4-Max	4M-130HVDMG-040	Micro	13g	3.8Kg.cm @ 5.0V - 0.112sec/60° 4.0Kg.cm @ 6.0V - 0.096sec/60° 4.5Kg.cm @ 7.4V - 0.083sec/60°	Digital, High Voltage, Metal Geared, High Speed, High Torque, Very Low Play in Gears	1pcs £11.10ea 5pcs £8.15ea
4-Max	4M-094DHVMG-026	Mini	9.4g	2.0Kg @ 6.0V - 0.09sec/60° 2.6Kg @ 7.4V - 0.07sec/60°	Digital, High Voltage, Metal Geared , Ball Raced, 8mm Thick	1pcs £14.99ea 5pcs £14.17ea
4-Max	4M-160AH-027	Mini	16g	2.7Kg @ 4.8V - 0.13sec/60° 3.0Kg @ 6.0V - 0.11sec/60°	Analog, Great Value Mini Servo	1pcs £6.29ea 5pcs £5.66ea
4-Max	4M-175AMG-030	Mini	17.5g	3.0Kg @ 4.8V - 0.13sec/60° 3.5Kg @ 6.0V - 0.11sec/60°	Analog, Metal Geared	1pcs £8.73ea 5pcs £7.86ea
4-Max	4M-175DMG-030	Mini	17.5g	3.0Kg @ 4.8V - 0.13sec/60° 3.5Kg @ 6.0V - 0.11sec/60°	Digital, Metal Geared	1pcs £9.99ea 5pcs £8.99ea
New 4-Max	4M-183HVDMG-044	Mini	18.3g	4.4Kg @ 4.8V - 0.101sec/60° 6.5Kg @ 6.0V - 0.078sec/60° 7.3Kg @ 7.4V - 0.059sec/60°	Digital, High Voltage, Metal Geared, High Speed, High Torque	1pcs £14.99ea 5pcs £13.49ea
4-Max	4M-253AB-028	Standard/Mini	25.3g	2.8Kg @ 4.8V - 0.12sec/60° 3.3Kg @ 6.0V - 0.10sec/60°	Analog, Ball raced	1pcs £6.79ea 5pcs £6.11ea
EMAX	ES3004	Mini	17g	3.0Kg @ 4.8V - 0.15sec/60° 3.5Kg @ 6.0V - 0.13sec/60°	Analog, Metal Geared, Ball Raced	1pcs £12.09ea 5pcs £10.88ea
EMAX	ES3054	Mini	17g	3.0Kg @ 4.8V - 0.15sec/60° 3.5Kg @ 6.0V - 0.13sec/60°	Digital, Metal Geared, Ball Raced	1pcs £17.59ea 5pcs £15.83ea
4-Max	4M-455AH-033	Standard	45.5g	3.3Kg @ 4.8V - 0.15sec/60° 4.0Kg @ 6.0V - 0.12sec/60°	Analog, Great Value Standard Servo	1pcs £6.99ea 5pcs £6.29ea
EMAX	ES3001	Standard	37g	3.5Kg @ 4.8V - 0.17sec/60° 4.8Kg @ 6.0V - 0.14sec/60°	Analog, Ball Raced	1pcs £7.69ea 5pcs £6.92ea
4-Max	4M-410ABH-052	Standard	41g	5.2Kg @ 4.8V - 0.20sec/60° 6.5Kg @ 6.0V - 0.16sec/60°	Analog, High Torque	1pcs £4.73ea 5pcs £4.26ea
4-Max	4M-556AMG-087	Standard	55.6g	8.7Kg @ 4.8V - 0.15sec/60° 9.4Kg @ 6.0V - 0.13sec/60°	Analog, Metal Geared	1pcs £12.59ea 5pcs £11.33ea
4-Max	4M-556DMG-087	Standard	55.6g	8.7Kg @ 4.8V - 0.15sec/60° 9.4Kg @ 6.0V - 0.13sec/60°	Digital, Metal Geared	1pcs £15.74ea 5pcs £14.17ea
New 4-Max	4M-490AMG-108	Standard	49g	10.8Kg @ 4.8V - 0.13sec/60° 13.8Kg @ 6.0V - 0.11sec/60°	Analog, Metal Geared, Waterproof	1pcs £17.76ea 5pcs £15.98ea
4-Max	4M-620DHVMG-112	Standard	62g	9.35Kg @ 6.0V - 0.15sec/60° 11.2Kg @ 7.4V - 0.13sec/60°	Digital, High Voltage, Metal Geared, Dual Ball Raced	1pcs £18.89ea 5pcs £17.00ea
EMAX	ES3005	Standard	42g	10Kg @ 4.8V - 0.16sec/60° 12Kg @ 6.0V - 0.14sec/60°	Analog, Ball Raced, Waterproof	1pcs £27.49ea 5pcs £24.74ea
4-Max	4M-556AMG-118	Standard	55.6g	11.8Kg @ 4.8V - 0.20sec/60° 13.2Kg @ 6.0V - 0.18sec/60°	Analog, Metal Geared	1pcs £14.69ea 5pcs £13.22ea
4-Max	4M-556DMG-173	Standard	55.6g	17.3Kg @ 4.8V - 0.18sec/60° 20.4Kg @ 6.0V - 0.16sec/60°	Digital, Metal Geared	1pcs £17.84ea 5pcs £16.06ea

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1200kv	9x5	635g/ 1.40lbs	42MPH
1400kv	8x6	810g/ 1.79lbs	55MPH
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2200kv	6x3.5	470g/ 1.04lbs	59MPH

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New

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ToolKitRC Q4AC - 200W, Dual I/P, Quad O/P

The ToolkitRC Q4AC is a Dual Input, Quad Output Smart Charger. 1-4S LiPo, LiHV, LiFe, Lion and 1-10S NiMh.
The charging power output on AC is up to 100W, on DC with a suitable power supply up to 200W.The Q4AC has intuitive menus.

New

£69.99

ToolKitRC M7AC - Multifunctional Dual I/P, 350W Charger

The M7ACs core function is being a single channel battery charger. 100W O/P when powered by AC and 300W when powered by DC. It is compatible with the main battery chemistries and supports direct connection with both XT60 and XT30 batteries.

£84.99

ToolKitRC M7 - is the worlds smallest 200W charger/ servo tester/cell checker with a colour screen!

Same size as the popular M6 but with 33% more power! With a 200W, 10A charger at its heart the M7 also has a servo tester, cell checker, a wattmeter, PWM/PPM/Sbus input testers and output generator along with a variable voltage and current DC output control. All of these features at an fantastic low price of

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Counterpoint

A selection of new gadgets, kits and bits for you to buy

TOP RC SF-260

£88.99 I www.jperkins.com

One of the latest additions to J. Perkins inventory, TopRC's SF-260 is a super-detailed, 450mm span ready-to-fly EPP interpretation of the Italian SIAI-Marchetti military trainer. Available in a choice of vibrant colour schemes this suitcase-friendly 4-channel indoor / park flyer can be enjoyed by beginners and experts alike thanks to a 6-axis gyro whilst a fixed, demountable trike U/C make both ROG and hand-launch operation a breeze. An efficient electric powertrain served by a 1S 400 mAh LiPo combine to provide a healthy duration of around 12 minutes. Available from your local J. Perkins stockist for £88.99. For an in-depth review, check out David Ashby's report of this lovely model in last month's issue of RCM&E.

X-FLY SPITFIRE

£299.99 I www.cmldistribution.co.uk

One of the most iconic warbirds to have graced the skies during WWII, the Supermarine Spitfire remains a firm favourite in aeromodelling circles. Joining the ranks at CML Distribution is this new scale Mk. IX replica from XFly, crafted from EPO for a 1200 mm wingspan and available in two distinctive matte finish liveries: the desert brown edition that featured in North Africa and the Mediterranean circa 1943, and the green D-Day Invasion version from 1944, piloted by Canadian Ace Johnnie Johnson. Scale details include a 4-blade propeller, accurate canopy outline, pilot figure, exhaust stacks, cannons and outward retractable landing gear. The large battery hatch can accommodate a 4S 2600 – 4000 mAh LiPo, fuelling the combination of 3541-KV745 motor and 40A brushless ESC that provides plenty of power and achieves excellent thrust-to-weight ratio for a satisfying scale performance. Metal main landing gear with shock absorbing struts and efficient electric retracts deliver outstanding ground handling performance, whilst four panel split flaps – as per the full-size – make for easier take-offs and landings. Day-bright LED wingtip lights aid visibility and add realism. Supplied in PNP format, you'll require the aforementioned LiPo, 6-channel Tx / Rx and charger to complete the model. Dig out your March issue of RCM&E and turn to page 8 where the Ed' gets his hands on a pre-production example of the desert version.

Phil Stone's Latecoere 631 looks magnificent during its first post-renovation flight under a threatening sky. See 'French Flotation'.

HUMILITY & HUBRIS

Dave Goodenough stuns on the catwalk before embarking on another selection of workshop-based advice and guidance

Words & Photos: **Dave Goodenough**

Let's start with a frightener... Does your wife/partner/tamer/nurse/doctor enjoy your hobby? Do they take part, just nudge you along disconsolately or simply put up with your particular bent? My wife of, oh so long, has borne my obsession with this wonderful hobby for over half a century of tolerance and forbearance. In short, she's a gem.

However, a week ago I had cause to rethink my ignorant lack of understanding her. She presented me with a gift that marks me out and nails me good and proper as a dedicated R/C model aviation nerd, even getting a dig in with her single word *nom-de-plume*. The pictures say it all, the red face is well-earned, and I'll wear the tee shirt with humility.

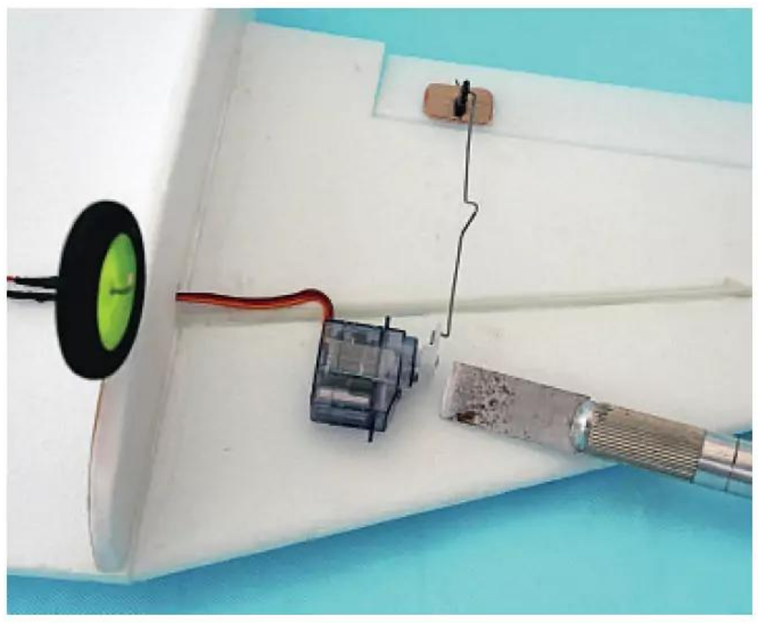
Icarus indeed!

My wife, ever taking the mickey out of my predilections (that'll be model aircraft then!) gave me a tee-shirt to remind me of my limited proficiency.

Icarus indeed! Methinks my wife believes I fly rather too high.

STUCK UP?

Sometimes your 'I'll do it my way' glands get you in a bit of a pickle. With small servos in the nano and micro range of 1.7 g to 5 g being in many cases incredibly cheap and very reliable, I tend to buy the things in multiples of up to ten at a time. Being fatalistic about them I expect



What do you do when you gum up a servo with glue? Carefully slip the knife chisel blade under the servo and ease it off, then curse yourself for stupidity!

a failure rate of about 10% when I pre-test them: you DO pre-test, don't you? Building in a dud servo is very annoying and digging it out from a supposedly permanent mount is both destructive and frustrating. It's worse when you've been a total ninny and managed to ruin a tested and perfectly good servo by screwing up the installation.

I perpetrated such dimwittery on the little foamie I was building, where the 3.7 g servo was simply glued to the undersurface of a foam wing. It worked fine when on the servo tester but refused to move once the Gorilla Glue Clear had set. Cue wailing and gnashing of teeth, then the use of a 10:1 magnification loupe to eyeball the sullen servo. There it was! A little drool of glue had oozed onto the splined servo arm shaft and capillary action drew the tiny dribble into the servo innards. Some inventive sliding of a craft blade under the servo body risked both fingertips and the Depron wing, but off came the little operator with minimal wing damage. The ruined servo was binned but its lead and plug were saved for future use. Another servo was carefully spot glued and aligned, this time without gumming up the works.

FRENCH FLOTATION

A few months ago, I highlighted a clubmate's model refurbishment, showing what can be achieved with even an old and scrofulous looking second-hand model, providing the basic structure remains sound.

The original aircraft may not have been a success but Phil Stone's restored Latecoere 631 has proven itself to be a superb PSS model.

Phil Stone's Latecoere 631 flying boat finally made it to the LMMGA 'Gate' slope on a cold and blustery day, was prepped and, with a mighty heave from Harry Twist, cast out unto the perils of the sheep besmirched slope.

Never mind the weakened knees and shaking digits, Phil mastered the gorgeous gusset-strainer and with just a little finger trembling Tx trimmery, settled his French Fancy into an increasingly adventurous flight. Becoming ever more comfortable with the big boat, our man began to toss this sleek product of the mid-20th century years over ever larger volumes of sky, until a stretched low turn over an area of reduced lift saw the beauty sink towards the sea of grass and slide to a stop. An out-landing, true, but not too far to trudge for recovery.

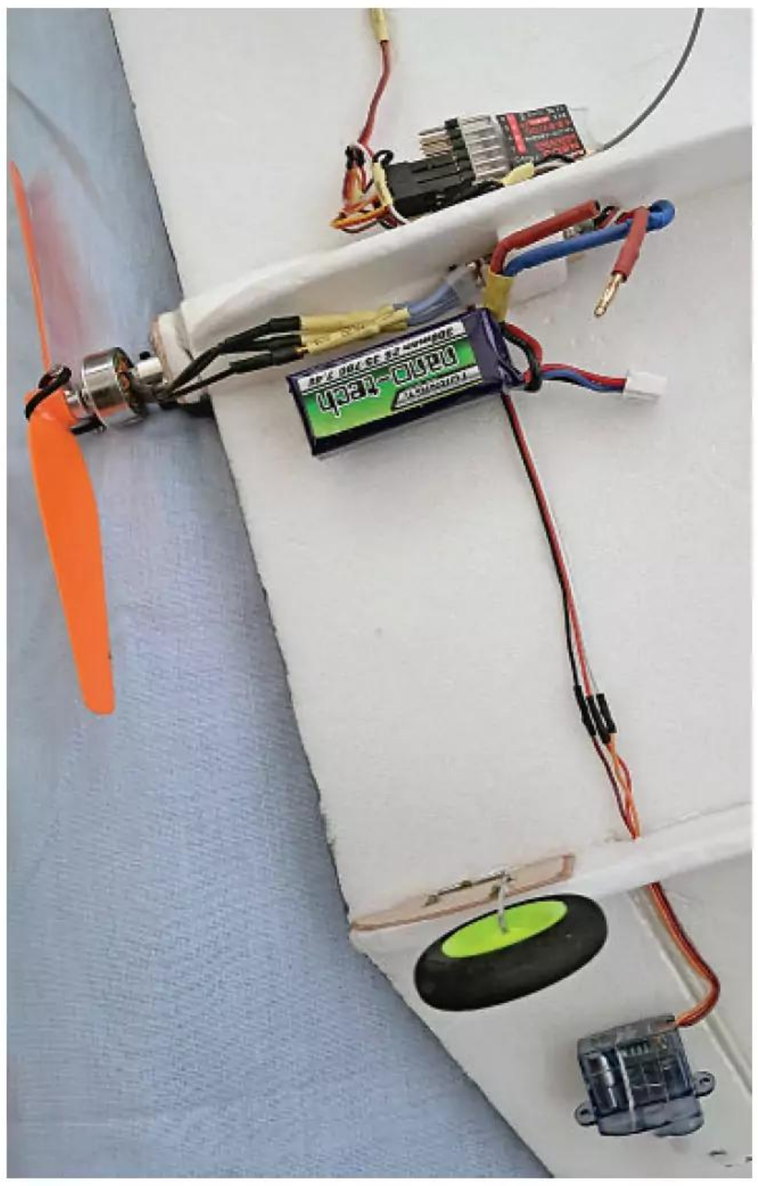
With nil damage we had a happy Phil and another lovely model to grace the skies in the future. Have a look at the in-flight photos and see what you think. Isn't it a super sight to see? Just remember, if Phil can do it, so could you. There's slumbering life in them old airframes. It's up to you to wake 'em up!

Espied alongside the Latecoere was the new Stone-designed BAE 'Hawk' in virginal white Correx plastic. I'll be having a chat with Phil about this novel construction and also his use of 3D printed detail parts for the model. I may be an old dog but I'm open to learning new tricks and his treatise, in the September to November 2024 issues, will point the way!

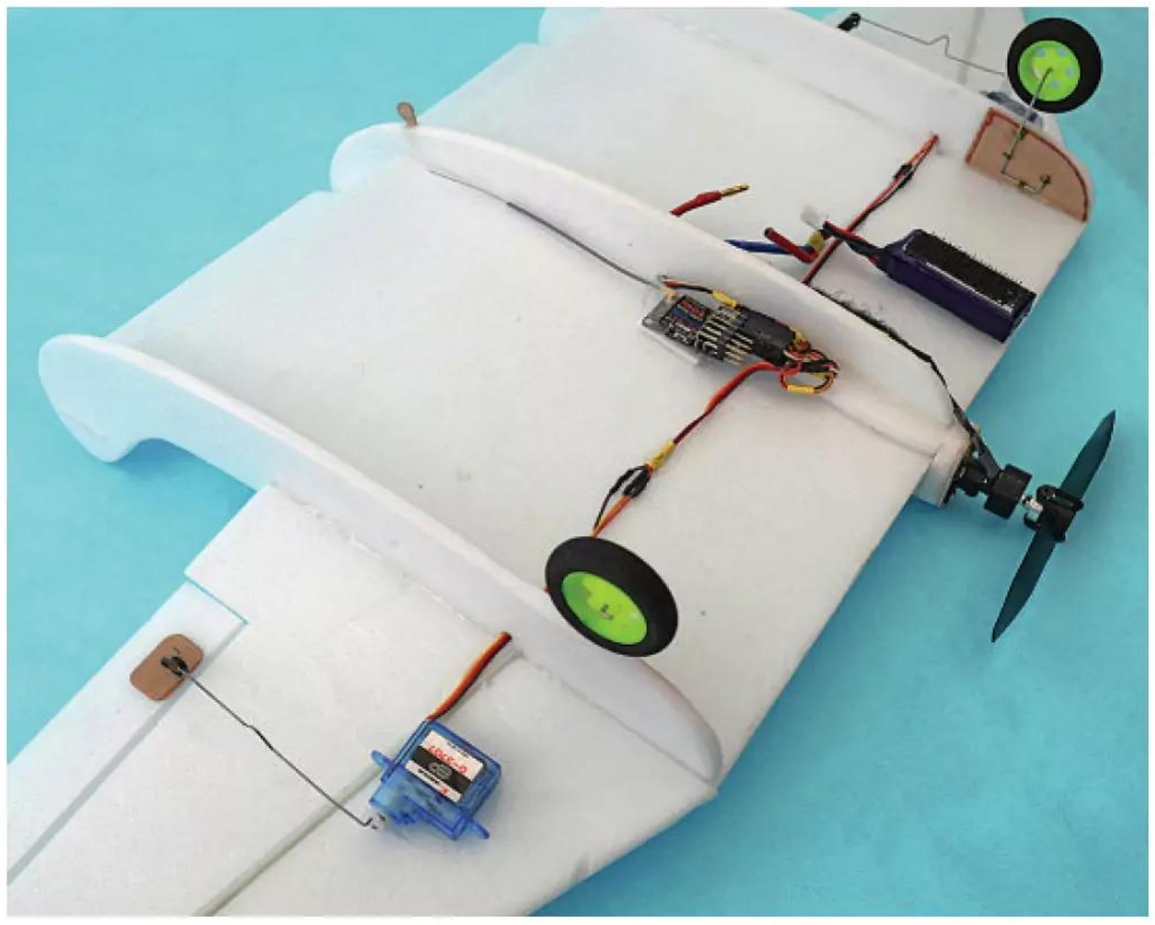
BEGINNER'S BUNDLE

The very simple Depron model of the Burnelli B-1000 I've been building reached the stage of assembling the basic electronics. Apart from the hiccup with one servo along the way, as described earlier, all has gone well.

Power is via a 5 g, 2000 kV outrunner, a 4" x 2.5" prop and a 6A ESC (because it



Radio layout under the Burnelli's flat plate Depron wing. Wires shortened, soldered, shrink-tubed and tidied - all sorted.

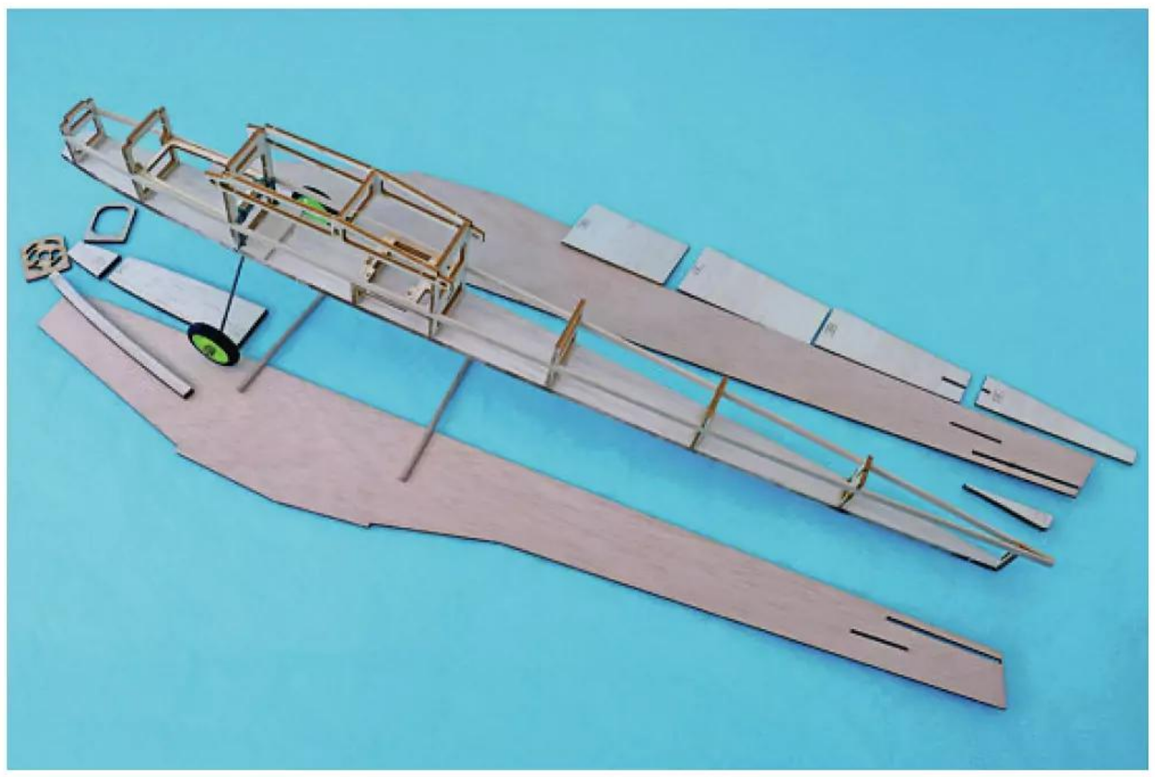


The Burnelli underwing avionics are now as tidy as possible, considering the model's simplicity.

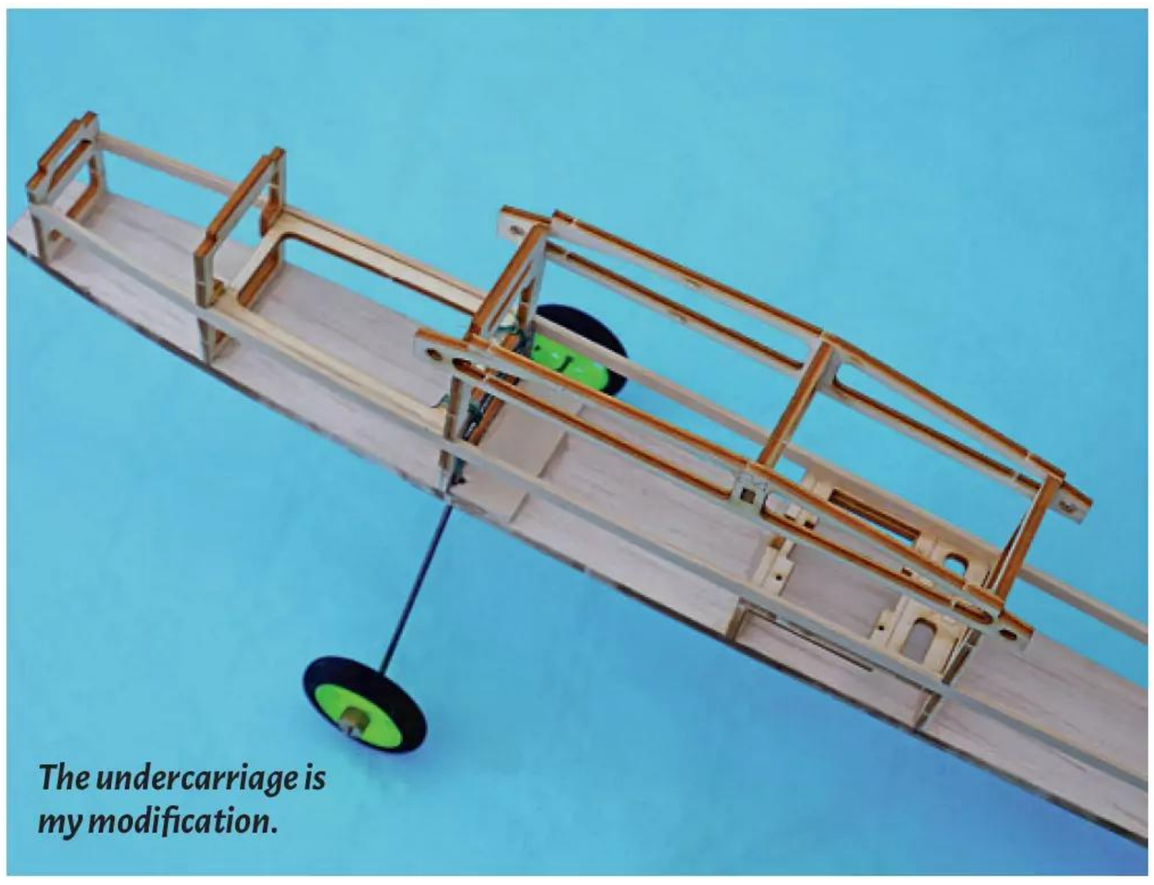
Possibly the best hinge material for small Depron models - Blenderm surgical adhesive tape. Sticks like brown stuff to a blanket!

How simple is that! The little Burnelli B-1000 is just about as uncomplicated as a 'scale' model can be.

Hiesbok Easy 2 is a superb entry into the 'first built-up' model arena.



It's dead simple to build, virtually impossible to get wrong and tough enough to survive 'arrivals'.

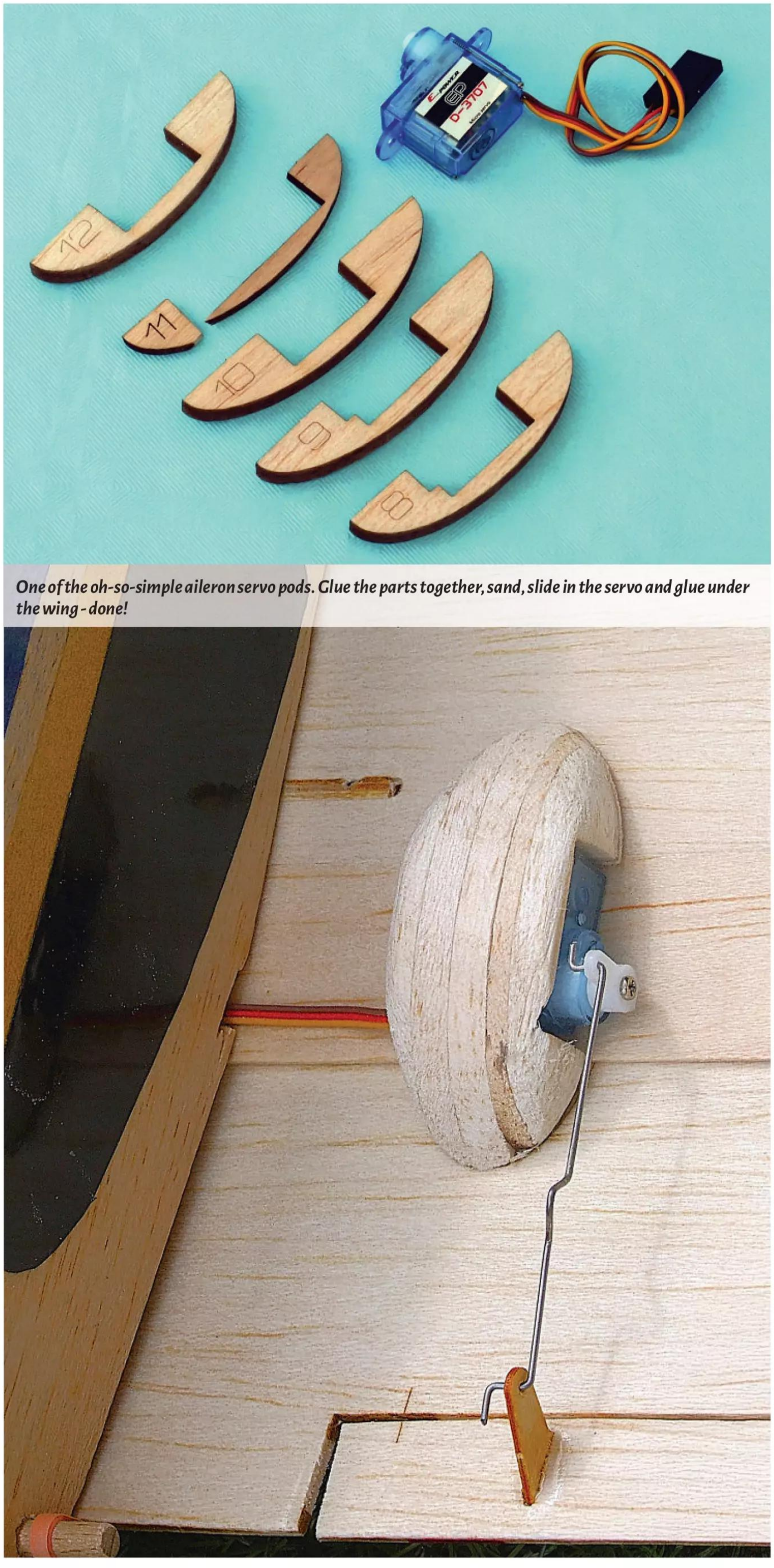


The undercarriage is my modification.

was available). With virtually all modern transmitters having an elevon function only two 3.7 g servos are needed to control roll and pitch, your basic left/right and up/down. One drawback is the festoon of wires and plugs attached to the servos, ESC and receiver. On a small model like the B-1000 that amounts to a lot of superfluous wire and, of course, weight. So, what to do?

Easy answer - and hold your breath - cut it off! We covered simple soldering a while back and that's the only real skill you'll need, other than the ability to manipulate small parts and components.

The photos show how the servo leads were cut, extended and, after soldering, shrink tube covered. The three ESC motor and power input wires were shortened and its signal lead to the receiver reduced too. It may look drastic but around 8 g to 10 g was shed in the process without affecting anything electronically,



One of the oh-so-simple aileron servo pods. Glue the parts together, sand, slide in the servo and glue under the wing - done!

I fitted an extra support rib alongside each aileron servo pod. It prevents flex of the Jedelsky wing and inadvertent aileron deflection.

providing the wires were soldered 'like-for-like'. It goes without saying that you never, ever cut the receiver aerial!

With all the control components adhered with either foam-safe cyano, double-sided foam tape or Velcro, the power source battery was left until last and simply held with more Velcro and used as an adjustable weight for Centre of Gravity adjustment. I used an old 300 mAh 2S LiPo simply because it was spare, but you could use a smaller, lighter battery.

With a conservative CG balance at 25% of average wing chord it was off to the long grass to test the as yet unpainted model. But you'll have to wait for that...

REGRESSION THERAPY

Recently I got in touch with my simple side. Some would say that's a normal state of affairs for my overwrought mind! I saw a discounted offer for the Crafty Products Hiesbok 'Easy 2' that I'd mentioned before and shelled out a reduced amount of coin to purchase it. It's sold as an easy to build and fly model on the beginner's spectrum, but I had a far darker deed in mind. Designed to take minimal power and be oh-so gentle, I intended to ginger it up a bit for some cheap fun at the patch.

A rummage through the 'useful' drawers brought forth adequate oomph of around 50W or so, enough to whip up a minor frenzy in the little model but not so much that I'd rip the wings off.

Ailerons are de rigueur for most 'throw it all over the sky' models and I initially resisted the already marked-for-use ailerons. The wing is of 'Jedelsky' construction, all balsa, with a pre-shaped front section and a thin sheet rear, just as with the 'Lilienthal 40' that I built and modified for illustration purposes last year. The model's construction is designed to be 'beginner tough' so I had no qualms about putting a bit more grunt through it.

A build log isn't needed for this kit. It's dead simple to assemble and completely logical.

Easy 2 after its first wing fitting. Notice the slight aileron 'up' deflection caused by rubber banding the wing in place. Those reinforcing ribs alongside the servo pods fixed it.

The post-operative and truncated tiddler. It may have started life as a children's toy but it's now a super sloper.

The laser-cut parts are the best I've ever used and the coloured plan is a doddle to follow if you've built a previous model and 'got your eye in' at working with a plan. Odourless cyano glue was used as I became sensitised to standard CA glues some years ago and I only ever use odourless for my, now, minimal usage, mostly on foamies and small models.

Wing and tailplane covering was done by using remnants of tissue from other model builds, to keep the overall construction cost down. A random pattern can look quite attractive and makes flights easier to follow. The fuselage was similarly covered with tissue as it both strengthens the structure a little and gives moisture resistance.

All the covering and doping was completed with the acrylic varnish/tissue method outlined several months ago. Wet out an area of the model with water-based varnish, lay the tissue carefully in place and brush/stipple the piece gently, working out any wrinkles with care. This method adds little weight, renders the structure water resistant and adds a bit of crash resistance.

Of course, you could always use the basic beginner's option and build the model as a rudder/elevator device. It would be a great second model or a 'first beginnings of built-up construction with a bit of covering' plane.

How simple is that? An 8 g servo either side, linked to a light control horn by an 'adjustable' pushrod - job done!

Hollow out the foam inside the 'cockpit' and there's room for small standard bits - a 5 g receiver, 2 g UBEC and a 300 mAh 2S LiPo. Don't forget to add canopy retention magnets.

"The Lidl glider makes for possibly the simplest and easiest R/C conversion of any model I've found"

How do you operate ailerons/elevons at a dihedral and wing taper break? It's easy. Use two end plates at the 'break', with a carbon pin glued to one and free to move in t'other. Basic, but it works well.

FLING-N-FLY

Sometimes the simplest of playthings can be convinced to become more than the original concept, especially when the model concerned was thought to be beyond further use. Foamie chuck gliders have been 'done' for R/C previously and pictured here before.

My little R/C converted Mk.1 Lidl chuck glider had suffered from poor storage. Okay, I admit it, I lost it amongst all the other stuff! After finding the poor thing bent up (the fuselage was horribly deformed) I had a bit of lateral thought, so I cut it off - the rear fuselage that is. Knowing that some directional guidance was a necessity, a spare piece of 1/16" balsa sheet was pressed into service as a fin, glued into a slot cut into the stubby fuselage tail after some black film offcut was ironed onto the balsa.

The previous iteration of the glider had ailerons fitted and it was but a few minutes work to change the transmitter settings from aileron to elevon. Well, that was it really. All done and it just needed balancing before testing.

A cheap mini receiver, a 300 mAh 2S LiPo and a tiny UBEC (to drop the operating voltage from 7 to 8 volts down to 5V for the servos) were shoved under the hollowed-out 'canopy' and a fingertip balance of the plaything gave an approximate Centre of Gravity of 25% wing chord, spot on for first test flights.

The final check was for weight - a mere 200 g. With the relatively large wing area that means the model will fly in a breeze little greater than a fa**... err, natural bodily function.

The Lidl glider, as sold, makes for possibly the simplest and easiest R/C conversion of any model I've found. They cost so little that you can afford to mess one up and buy another to get things right the second time round. There's even a Facebook group dedicated to the things. The Mk.1 thick wing trailing edge is perfect for using a piece of 1" x 3/16" balsa trailing edge stock as ailerons and elevators, or elevons, easily hinged with Blenderm self-adhesive surgical tape. The nearby photos should tell all, even the simple adaptation that allows for the wingtip taper and dihedral break.

NURF-LIDL

The German for tailless is 'nurflugel' and it didn't take much to translate that to 'Nurf-Lidl' for the truncated toy. Taken to the slope edge, to an outpouring of derisive comments, I gave the thing a little push and hung on tight to the tranny. Some tentative twiddling of the transmitter sticks kept it airborne whilst the trims were altered, after which I just had fun. The comments changed to *'Can I have a go?'* and the little bendy toy was wrung out and bounced across the landscape a few times. *'I gotta get me one of them'* was muttered and the consensus ended up as '*great fun*'. Why don't you give it a try when you next see them on the shelf?

TAILSKID

I make no claim to have anything in common with that man of genius, other than one annual anniversary - I share a birthday with Albert Einstein. Another thing to mention is my belief in his statement about being deeply involved in a process that gratifies and improves:

"That is the way to learn the most, when you are doing something with such enjoyment that you don't notice that the time passes."

Spot on for our hobby, don't you think?

Send me an email: **Coetquidan@yahoo.com**

USEFUL LINKS

Hiesbok 'Easy 2'
https://craftyproducts.co.uk
Den's Model Supplies
https://www.densmodelsupplies.co.uk

Lindsay's 'Skywriter' (RC2124) is a 48" span sport biplane for an 1100 kV motor powered by a 3S 5000 mAh LiPo. See RCM&E, October 2013.

DRAWING A PLAN PART 2

Continuing from the last issue, ***Lindsay Todd*** *describes the first steps in drawing a plan for a semi-scale aircraft*

Words & Photos **Lindsay Todd**

Let's deal with some simpler issues for the Valiant design, namely the fin and tailplane. As this is a semi-scale model there is a popular option to increase the tail surfaces by about 10% to improve flight stability. I have incorporated this on several designs and I concur that it does seem to give an improvement in performance. If I chose to go this way, then it's a simple maths question to recalculate the surface area at 10% larger while retaining the shape.

For a semi scale model, I have opted to go with 6 mm sheet balsa main tailplanes with built up elevators and rudder from a combination of strip and 2 mm sheet. This can be easily shown with a plan view and a sectional view through the surface to show its construction, adding details like thin ply for control horns and the additional thickness of material such as the wire joiners for the elevators.

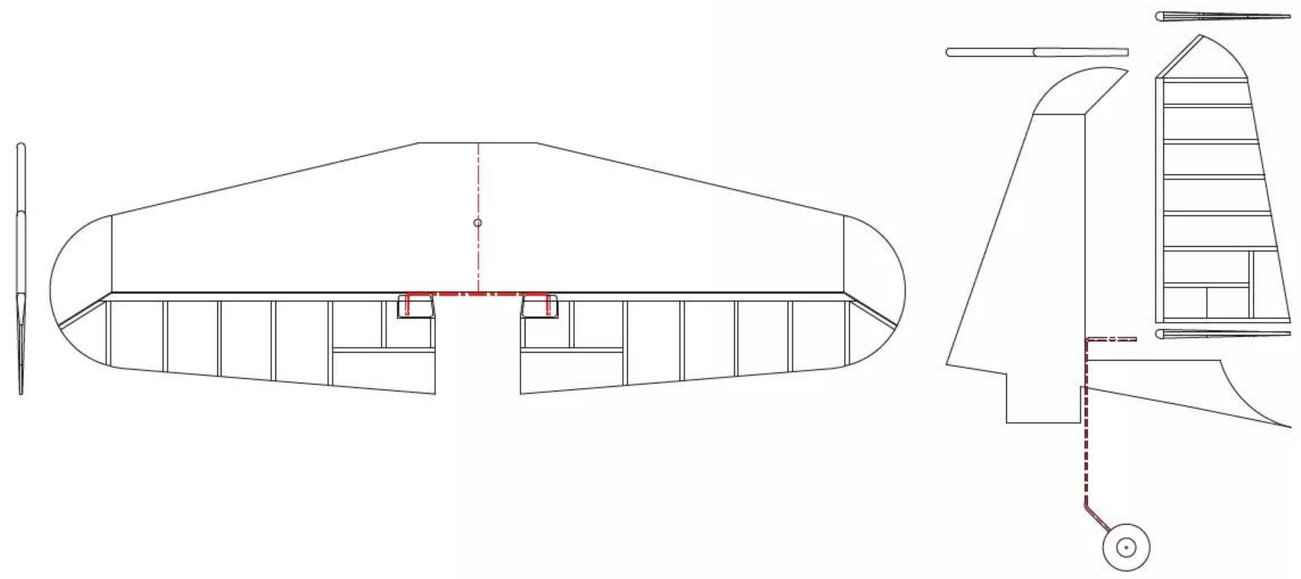


Fig.11 - Tailplane Tailplane and fin/rudder details.

The fin needs to key into the fuselage and have a very precise location so the use of a former as a key face is useful or even use a defined pocket to locate it. Fillets can then be shown, made from soft carved balsa block on either side, as can additional features such a tail cone aft of the elevators and wing fillets.

WING BUILD

Now for the scary bit - the wing. Really this is pretty straightforward and many designers find a method that works for them and pretty much stick to that in terms of basic construction.

Dealing with wing ribs first, there are many of them, often each one being different in length and depth. So, each needs to be plotted out in a similar way to how we produced the fuselage formers. Whereas with the formers we have the fuselage datum line as a reference, with the wing we generally use the main spar.

The first task is to locate an appropriate position for the main spar. This presents a couple of questions as to how we propose to make the wing: is this a traditional built-up structure with a continuous main spar or is it a two-part construction with, maybe, a tubular joining system or even a 'through the fuselage' option. Once this decision is made then the spar position can be addressed. Given the shape of most wing sections, it is always prudent to position the main spar at the position of greatest thickness, which in turn relates to the strongest section that can be created. In practice this often puts the spar in very close proximity to the Centre of Gravity position.

Given most people's limited building space then the option to build two wing panels that are joined at an optimal stage in construction is a good thing. This also aids the designer by saying, '*Now repeat a mirror image example*'! So, we draw a wing panel consisting of a main spar, a leading edge, a trailing edge and a series of interconnecting wing ribs. To connect the wings, we will use a joiner, either glued directly to the main spar (and indeed a rear spar if necessary) or possibly make use of joiner tubes. For smaller span models we may even get away without a joiner, assuming it is generally flat with no dihedral. (Dihedral is the angle the two wing panels are joined at.)

In Figure 12 I have shown a few of the key wing ribs for the Valiant on the right, which are broadly speaking scale in section, although I have increased the thickness at the tip slightly for both ease of construction and potential slow speed handling characteristics. Basically, this change allows me to pretty much use 6 mm square section spars along the entire span. The little tabs on the second rib allow for the structure to be built flat and the first rib profile also shows the 1.5 mm balsa skin as a general construction guide.

The drawing also shows a plan view of the wing configuration from the centre rib to the fourth rib out, which covers many of the structural features you may find such as an undercarriage block, a servo hatch and a control surface hinge line.

RIB FUNCTION

In terms of rib spacing, we need to assess what the ribs actually do. For much of the wing they are merely spacers between the upper and lower

Why not let your imagination run free when designing a model! This is Terrysaur, Lindsay's slope soaring take on a flying dinosaur, as featured in the September 2020 issue.

Another wild card, this time a flying mammal! Batty spans 36 inches for a 3S set up. The plan for this one can be found in RCM&E, May 2016.

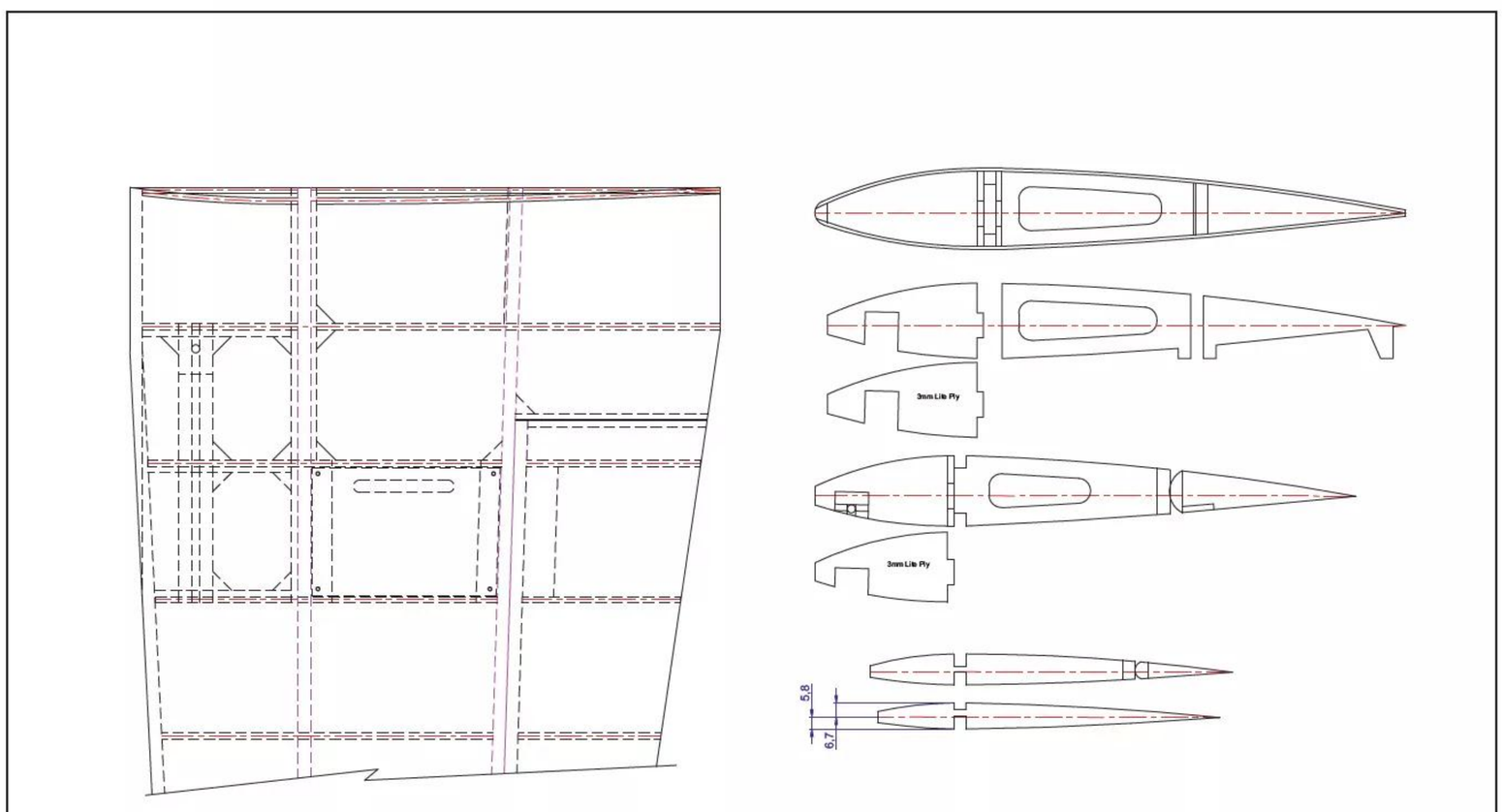


Fig.12 - Wing centre section detail and ribs.

Don't let a curvaceous fuselage put you off. Revisit the Debutante plan in the May 2012 issue to see how it's done.

Woodpecker is another design that features one of Lindsay's signature open rear fuselages. This was the Pro-Plan in November 2017.

skins, creating the appropriate profile. In other areas they add structural strength so material selection and spacing needs to be appropriate to these scenarios. Generally, I find 60 mm spacing is about right for a 1.5 mm wing skin to prevent sag between the ribs. Additional ribs, including doublers, are then introduced around undercarriage fixing points or servo mounts etc.

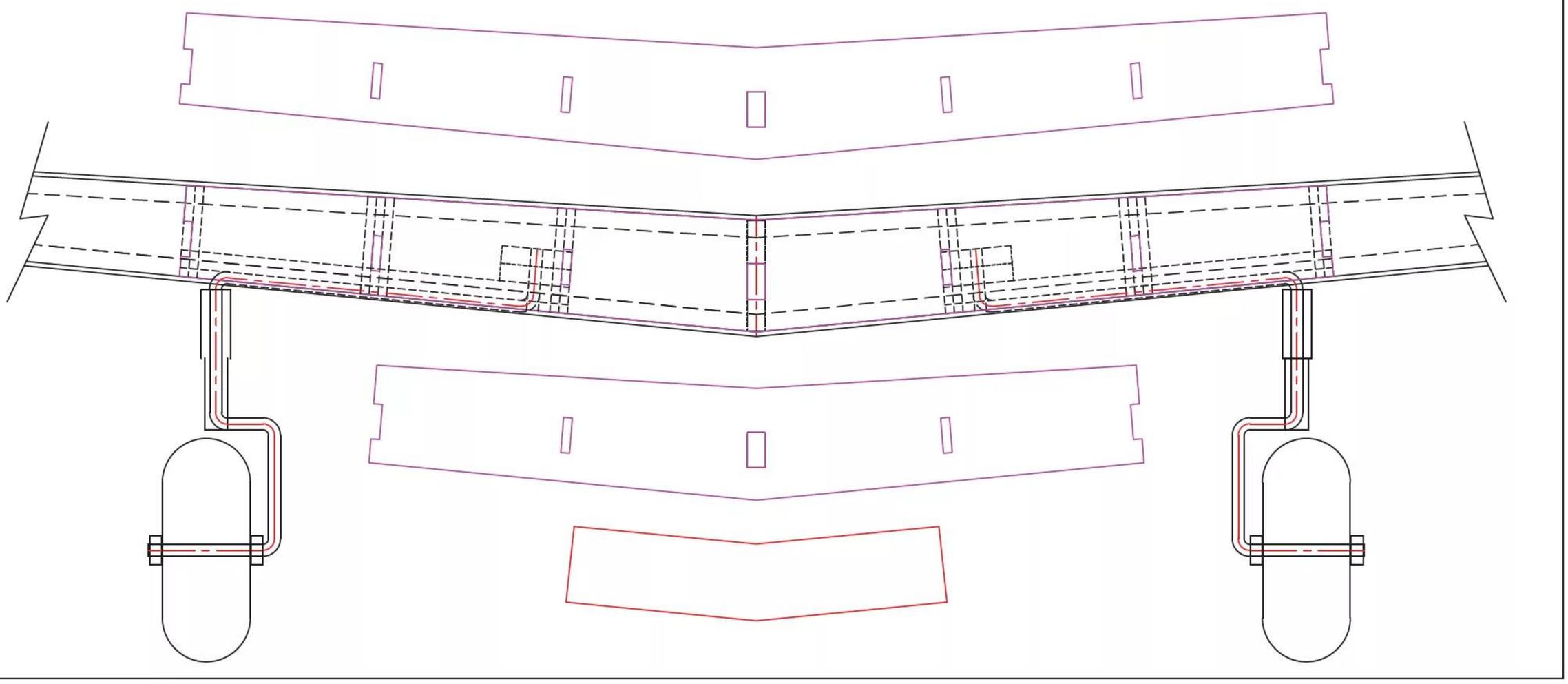
Starting with the plan view of the wing there is an outer profile, which in this case shows two spars highlighted. These are of 6 mm square section, with the intention of the front being the main spar, which would be made of spruce, with the rear made from medium to hard density balsa. The front main spar is aligned with the thickest section of the wing rib. A 3 mm marine ply spar joiner is shown to both sides, extending to the fourth rib at the front and the third rib at the rear The rear spar is positioned such that it creates the rear hinge line for the control surfaces. This also has a 1 mm ply joiner to the front face, extending to the second rib. The leading edge has a line break so uses a scarf joint for maximum strength and in effect it becomes a third spar, again from 6 mm medium balsa.

We also have a control surface, in this case a flap, but the principle is the same and the plan shows the outline with a gap, a leading edge (again from 6 mm balsa) and also the location of a ply plate that would be a fixing point for a control horn that spans to riblets on the control surface. The detail is replicated on the rib profile on the right, showing the hinge line and radiused leading edge.

A location for a side mounted servo hatch from 1.5 mm ply, including 3 mm ply fixing plates, is also shown. These are the details that need consideration; for instance, does a suitable servo fit in this space? If not, then alternate solutions need to be considered and shown, such as a more traditional bell-crank.

The Valiant undercarriage will be a fixed 4 mm wire affair, so it needs hardwood mounting blocks setting into the leading edge. Balsa ribs alone are insufficient, so 3 mm ply doublers are added to the

Fig.13 - Wing centre section detail from the front showing the spar doublers and U/C mounting blocks.



front sections of the ribs, tied into the main spar. Additional triangular webs help both consolidate and dissipate energy throughout the structure from those less than perfect landings.

Figure 13 shows the proposed centre section joint, together with the main spar doublers highlighted in pink showing the locating slots for the ribs and the locations against the spars. This arrangement dictates the construction process as the doubler needs to be built into the spar and ribs then added, rather than slotted into a gap. These sorts of details need to be addressed by adding text to the plan. The lower red coloured doubler for the rear spar is a simpler slot in configuration and could be added once the panels are almost finished prior to sheeting. The final element shows the ribs and doublers around the hardwood blocks to carry the 4 mm piano wire undercarriage legs.

ADDING DETAIL

How much detail we add very much depends on the target audience. If the plan is purely for personal use, then the minimum required to purvey the information or even jog the memory should suffice. If we are looking to extend the sphere, if, say, to submit your plan to this magazine, then more detail will be necessary, but there is a balance between not enough information and too much. The use of additional text, drawing and photographic references will be a significant step forward in detailing constructional processes.

What you see in the final Figure 14 is the culmination of numerous steps following the sequences in this article to pull together a 'suitable' working draft. Further additions would relate to specifying material grades and thicknesses where appropriate. I have deliberately not gone into too much detail such as showing hinge lines, glue types etc. as the intended article would need to be a book, so any additions that we make are for clarification. When armed with our usual text and photos they should provide a prospective builder with the necessary steps for success.

I am sure lots of people are going to say, what about the wing section, what about the C.G, and no doubt many other aspects, but this is about creating a working drawing. It's a concept to build from, nothing more.

When time allows the Valiant will become a reality. I have already had the laser cut parts made and I am simply waiting for an opportunity for the project to commence. All being well it could be a future free plan (*Yes, please!—KC*) so, in addition to this article, it will provide a rare concept to completion project.

This not a 'How To', but a 'How I Do' feature, showing the challenges that the initial stages of model design presents and how I chose to tackle them. To me the hobby is very much a three-stage process: the design, the build and the flying. You certainly don't need to be an aerodynamic authority, although a basic knowledge undoubtedly helps. A familiarity with calculating theoretical CG and wing area, and a basic understanding of incidence and thrust lines do help, but these are subjects in their own right and for another time.

Work in progress! Now in primer, the Bristol Blenheim Mk.4 awaits final finishing and then flying, hopefully later this year.

PICTURE GALLERY

Included with this article are pictures of just a few of my designs that got as far as being published. The Blenheim is still a work in progress and, who knows, it may appear here one day. (*Yes, this one too, please!—KC*) But it's the most complicated design I have worked on as every drawing of it seems to conflict so just creating the shape took much research and the design has evolved, with several significant changes to the structure. Now in primer it awaits the final stages and flying, hopefully later this year. ■

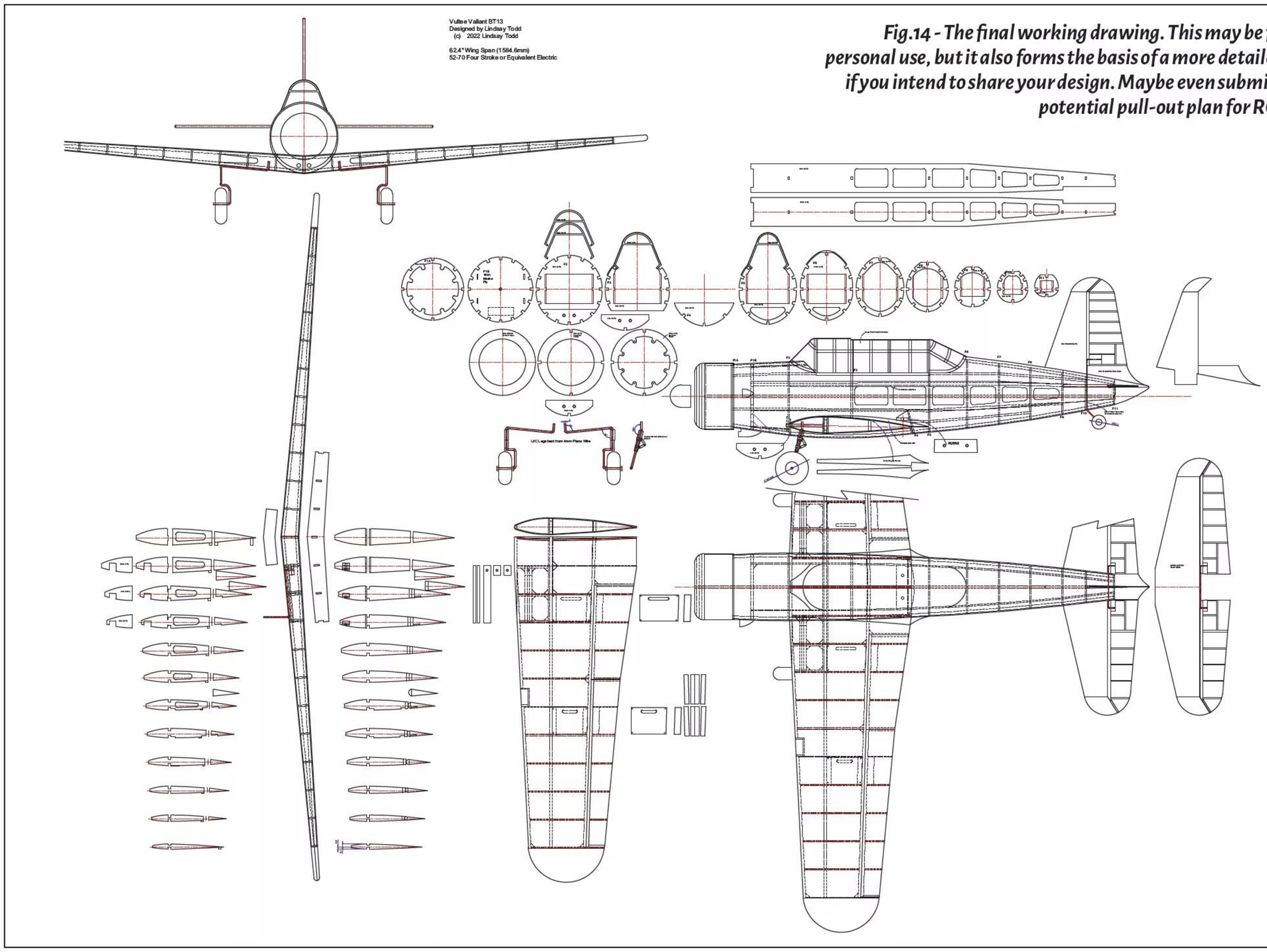


Fig.14 - The final working drawing. This may be fine for personal use, but it also forms the basis of a more detailed plan if you intend to share your design. Maybe even submit it as a potential pull-out plan for RCM&E!

All Write

Have your say in RCM&E's monthly chat room

Top letter

For his letter this month John Dimond wins a compact e455 multi chemistry AC input charger courtesy of Overlander Batteries: www.overlander.co.uk

FOAM SAFE PRIMER

When I read Steve Hadland's query on 'Foam Safe Spray' in the March edition of RCM&E, I had just completed spray painting a new EPO foam model (photos attached) and thought my experience might be helpful.

First, I experimented with various spray can leftovers on scrap EPO from the model's packaging. Whilst applying light 'mist coats' avoided damage to the EPO, it would take many such coats to build up solid cover.

Furthermore, any inadvertent 'wetting' with paint melted the EPO. I tried pre-coating with water based polyurethane varnish, but this had little effect.

Some internet research led me to a spray styrofoam primer, Montana T2200 primer from London Graphics Centre, which I purchased online. This is a mid-earth coloured barrier coat which certainly works well, protecting the EPO from even heavy applications of spray paint. However, EPO tends to have mould release agent residue on its surface and primer/paint adhesion can be very poor. Before priming the model, I wiped down all surfaces with white spirit in the hope it might help. Even so adhesion is patchy and the finished coatings will scratch off with little provocation - so handle with care! This also made masking a bit tricky as masking tapes tended to pull the underlying paint/primer off. I found the best option was newspaper, lightly coated with low tack re-positionable spray mount, carefully removed soon after spraying.

Despite all the trials and tribulations, I'm pleased with the final result.

John Dimond

BEDROOM STORAGE

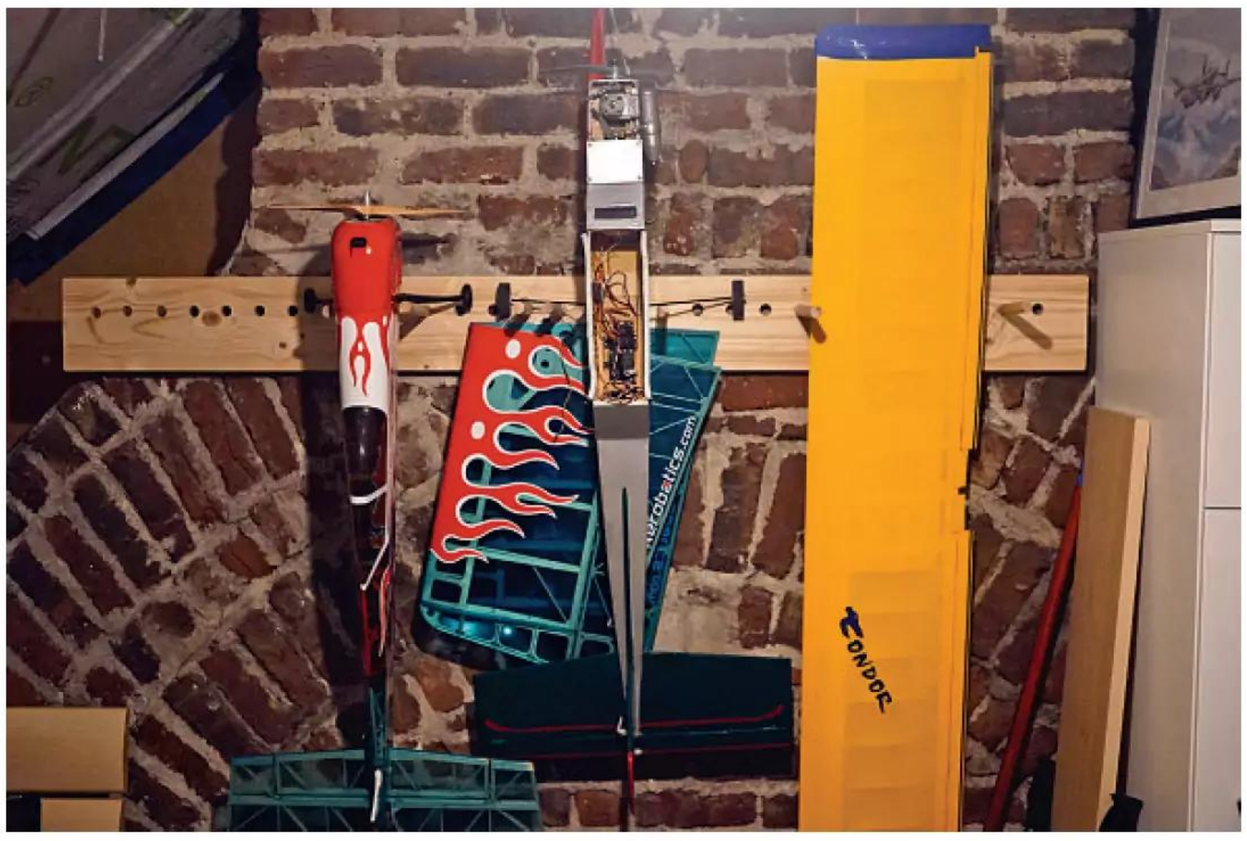
Being a teenager and having a limited modelling area, mainly confined to my bedroom, space was always an issue with my recently built (and still unflown) Super Flying Model Condor 40H. I was coping fine with pieces of the plane sitting on shelves and scattered around. However, when I saw a pre-built Precision Aerobatics Addiction X advertised for a bargain price I couldn't resist and bought it for future enjoyment. This left me in a dilemma for space.

My attic room is under renovation and I was concerned that the Addiction X would soon become covered in thick dust, running the risk of the many decals peeling off. Then my Dad had the idea of mounting a board on the wall with holes drilled at regular intervals to allow wooden dowels to pass through, which would hook underneath the undercarriage to hold the model. The wings were eventually slung underneath the Addiction X and the wing for the Condor was mounted alongside its respective fuselage using string. It was like creating my very own 'hangar' right there in my room!

The board I used is 1.5 x 6.5 x 183 cms, with 12 mm holes spaced 6 cm apart. I hope it is a help to anyone encountering the same problem!

Finally, I want to say thank you to RCM&E for getting me started in this hobby. I was given some of the older issues by a friend and it really inspired me to build the trainer that he gave me, especially knowing the sheer scope of what can be accomplished, especially at F4C level!

Jake Frazer



Thank you for your suggestion, Jake. Model storage is always a problem, especially when you start building up a collection of aircraft. Your rack is a very good solution and is a well proven way of holding models out of harm's way.

*Best of luck when the time comes to fly both of your models. Maybe send us a picture of you holding each one—we might be able to find space for those in Pilots' Pictorial - **KC***

kcrozier@mortons.co.uk

KINGFISHER TRIBUTE

Paul Dudley of Kingfisher Aviation, well known to many RCM&E readers, especially those interested in large scale models, sadly passed away at the end of 2024. Paul's daughter, Penny, and Ken Richardson of the North Worcester MFC have asked us to publish a few words about Paul:

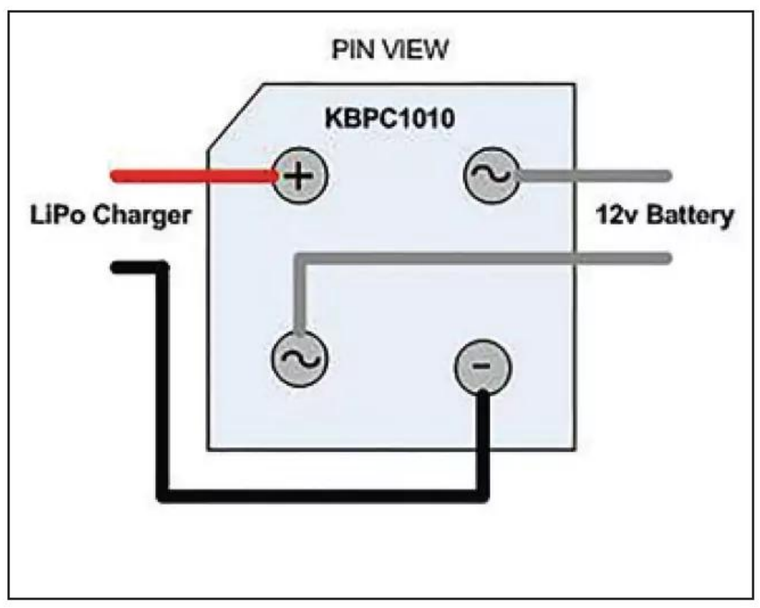
Paul started by working in the family's printing firm, then moving on to form Puma Model Racing Cars, succeeding as champion several times. He formed Kingfisher Aviation, which retailed aircraft modelling items, also becoming a prolific builder of model aircraft for clients. He told me when he was younger, he could build four models in a day! The quality of Paul's work was very good. He was a kind and friendly man, free with advice and help.

Paul was a central figure of North Worcester MFC, who loved building and flying models. His ashes were scattered on one of two of NWMFC's superb flying strips, which he loved.

He will be missed by all.

Penny Dudley (daughter) & Ken Richardson

CHARGER PROTECTION CIRCUIT



At my flying field we have a 12V solar powered facility which we use to charge LiPo batteries. I recently managed to reverse the connections to my charger after which it would not work. It was my fault for being careless, but a fellow club member did the same thing with his charger with the same result. Not wanting to repeat this, I fitted a 10-amp bridge rectifier (KBPC1010) in the power lead to the charger so that no matter which way round the power is connected the charger would not be damaged. The attached photos and diagram show the arrangement of the unit which cost around £2.50 to build and will save me, and other club members, from destroying another charger due to a 'senior moment'.

Ray Pinchin

Thanks for sending in details of your charger protection circuit, Ray. As usual with any DIY electronic projects, we asked our contributor with the most up to date 'E' experience to give a second opinion. Step forward our Retro Ramblings correspondent, Shaun Garrity:

You will lose approximately 2 volts via the two diodes used in the circuit, so the 12V supply will be delivering 10V to the charger. If the charger still works, then fine. It's a nice, simple project.

In my opinion the simplest solution would be to use a polarised connector so you can't get it reversed and see magic smoke! However, that would mean everybody using the on-site charging facility to agree to a standard connector such as an XT60.

Shaun Garrity

SCOUT APPRECIATION

I am writing to congratulate your contributor Nick Fellah on the article on his SE5a build in the February 2025 edition of RCM&E.

Although I am a keen aeromodeller, due to family and work commitments time constraints I am very much of the ARTF variety. It is gratifying and extremely interesting to see someone take the time and ingenuity to modify and improve the features of an already good kit manufacturer's model (DB Sport & Scale) to enhance its scale and very much life-like qualities.

The detail, time and effort involved are evident from the photographs. The series of pictures showing the radiator parts and assembly make it an engineering work of art and amplifies the thought and time that went into the modification.

Certainly, with retirement looming rapidly, it will inspire me to construct a kit build model and at the very least make me think about enhancements that can be made to my ARTFs to make them more scale-like.

Geoff Blachford

I just wanted to say how much I enjoyed the article in the February edition on the SE5a R/C scale build. I found it a very interesting read, with some excellent photos.

Barry Shaw

Hoverfly and umbilical cable.

HOVERING, BUT NOT AS YOU KNOW IT!

John Stennard is back with another diverse selection of inddor flying topics, starting with a tri-motor helicopter

Words & Photos: **John Stennard**

A bonus to writing for RCM&E is that I receive some interesting emails. These can be a follow up to something I've written, sharing information, or occasionally a request for advice.

A blast from the past came from Slater, who had been given a Snelflight Hoverfly helicopter. He was hoping to get this in the air after a long period in storage. Founded in 1998, Snelflight are still in business with drones, but their innovative helicopters have been out of production for some while.

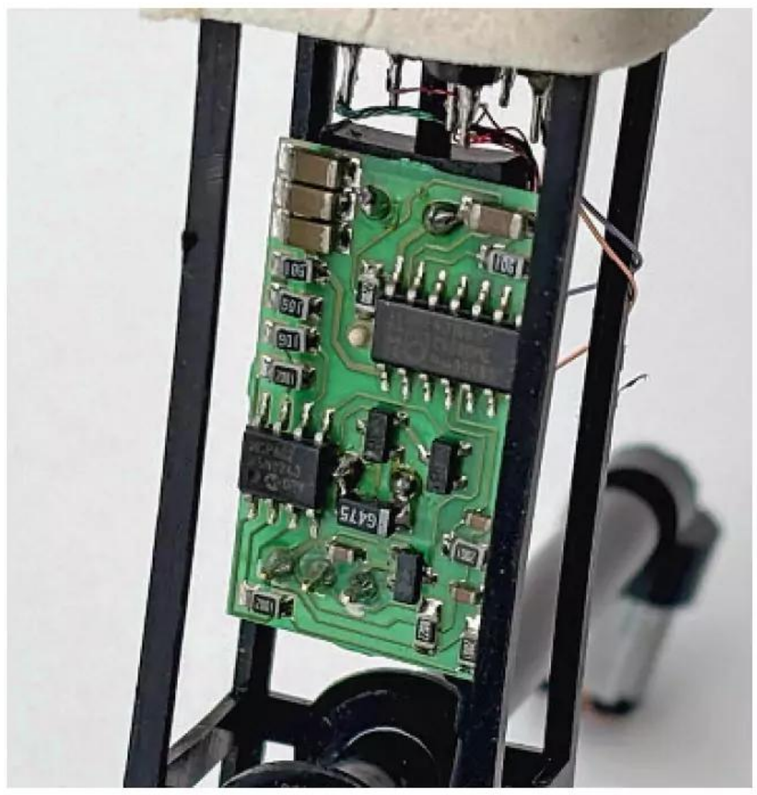
Before coaxial helicopters made piloting a helicopter easier the initial stages of just taking off and hovering could be challenging. I learnt to fly on a .30 size IC Hirobo Shuttle and found the new indoor Ikarus FP Picollo no problem to handle. However, I witnessed a number of first time heli pilots with models that seemed intent on self-destruction!

The Snelflight Hoverfly was a clever idea whereby the innovative helicopter was controlled via a 35 MHz Tx linked to the helicopter with an umbilical cord. This cord also supplied the power to the helicopter from a mains AC/DC power supply. It was intended for indoor use as a trainer for hovering and basic flight handling. However, don't think of the usual type of helicopter design as this one did not have rotor blades. It had a three carbon fibre (CF) arms with a small electric motor at each end. All the helicopter control was done via the speed of the motors and a very simple tail rotor. The helicopter required fine tuning; even the propellers had to be matched and were supplied in matched packs of three. The umbilical system offered the advantage of longer flight times and the cord was 3.5 metres in length. The Hoverfly package included 15 pages of A4 instructions and advice. They are incredibly comprehensive and detailed.

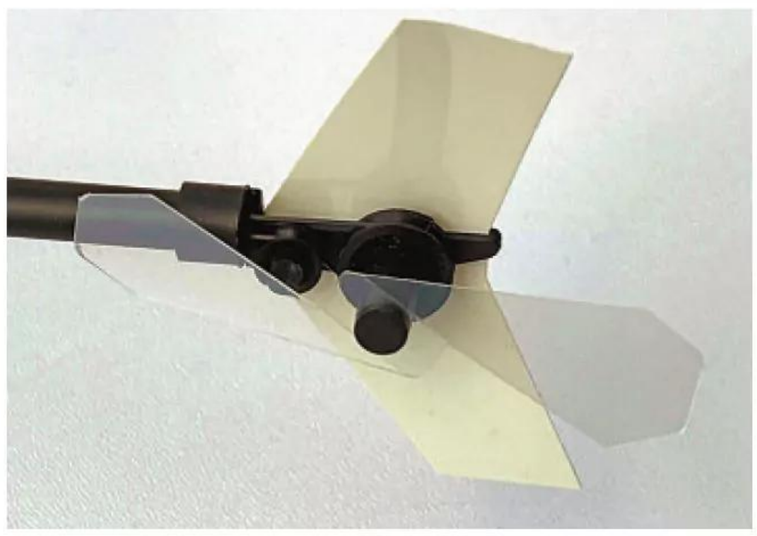
A friend gave me his Hoverfly to try to fly and the required 35 MHz Tx. I'm afraid I had no success so have not been able to offer Slater any advice on getting his up and flying. However, I do have plenty of spares!

Snelflight also produced a Chinook based on the same technology. I remember being interested in the Chinook but bypassed this model when Snelflight produced their Jump

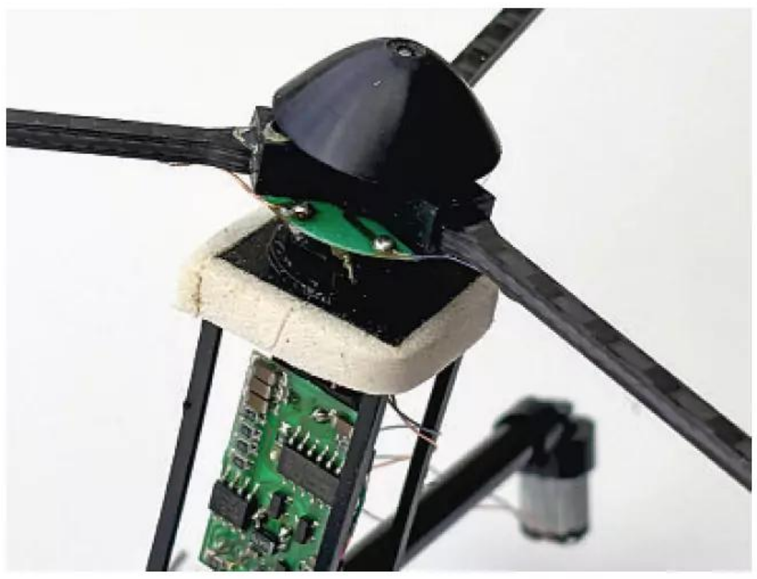
The Hoverfly was very innovative for the time.



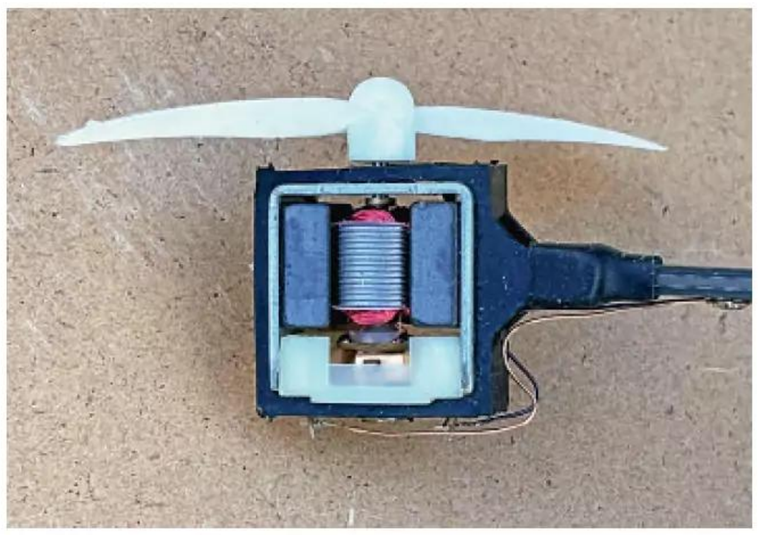
All the parts were very lightweight but a bit fragile. It used some clever technology for the time within the PCB control unit.



The tail rotor was belt driven from a motor mounted in the nose of the model.



Top of the rotor mast. No motor in there, of course!



One of the rotor tip motors. These had to be matched for smooth operation of the rotor.

In today's money the Hoverfly would cost around £440, shown here with a modern FP heli that costs a fraction of this!

Ready for take-off, the Avro Lancaster looks the part. See overleaf.

Jet quad. Interestingly, E-flite had the same idea of a twin co-axial and used their mCX heli as the basis of their 'scale' CH 46 helicopter. Originally, this suffered from a short duration but with the more powerful 1S LiPos it now has a good flight time and mine still flies well. Silverlit also produced a micro twin rotor based on the mechanics of one of their coaxial micro helicopters. Micro size helicopters always have a short flight duration and it was even shorter for this helicopter!

Coaxial helicopters really did revolutionise indoor heli flying for beginners, but the latest fixed pitch (FP) helicopters with 6-axis gyros have generally replaced them.

AVRO LANCASTER

I've shown a photo of fellow club mate and indoor flier John's Lancaster before and promised some more information. The airframe uses hot wire cut foam which accounts for the realistic final shape. The 'hollow' airframe has enabled John to achieve a flying weight of only 98 g for a 770 mm wingspan. Four 7 mm coreless motors are fitted using 65 mm diameter ex-drone props. These are set up for CW and CCW rotation.

The control system is interesting as John originally omitted the ailerons and instead used rudders and linked proportional motor control, plus elevator. A single 1S 380 mAh HV LiPo is used for power. Setting the yaw control using the combined rudders and motors has been very much a trial-and-error situation and requires fine tuning to achieve the best results.

John's Lancaster looks great in the air, but care is required in our relatively small flying area. Lancaster flights are always eagerly anticipated, although John is always relieved when his lovely model is safely back on the ground after a mission!

John had a chance during the summer to do more relaxed test flying outdoors and as a result has made changes. He has now fitted ailerons to his Lancaster and eliminated the proportional motor system. The model is now much easier to control in our four-court flying zone.

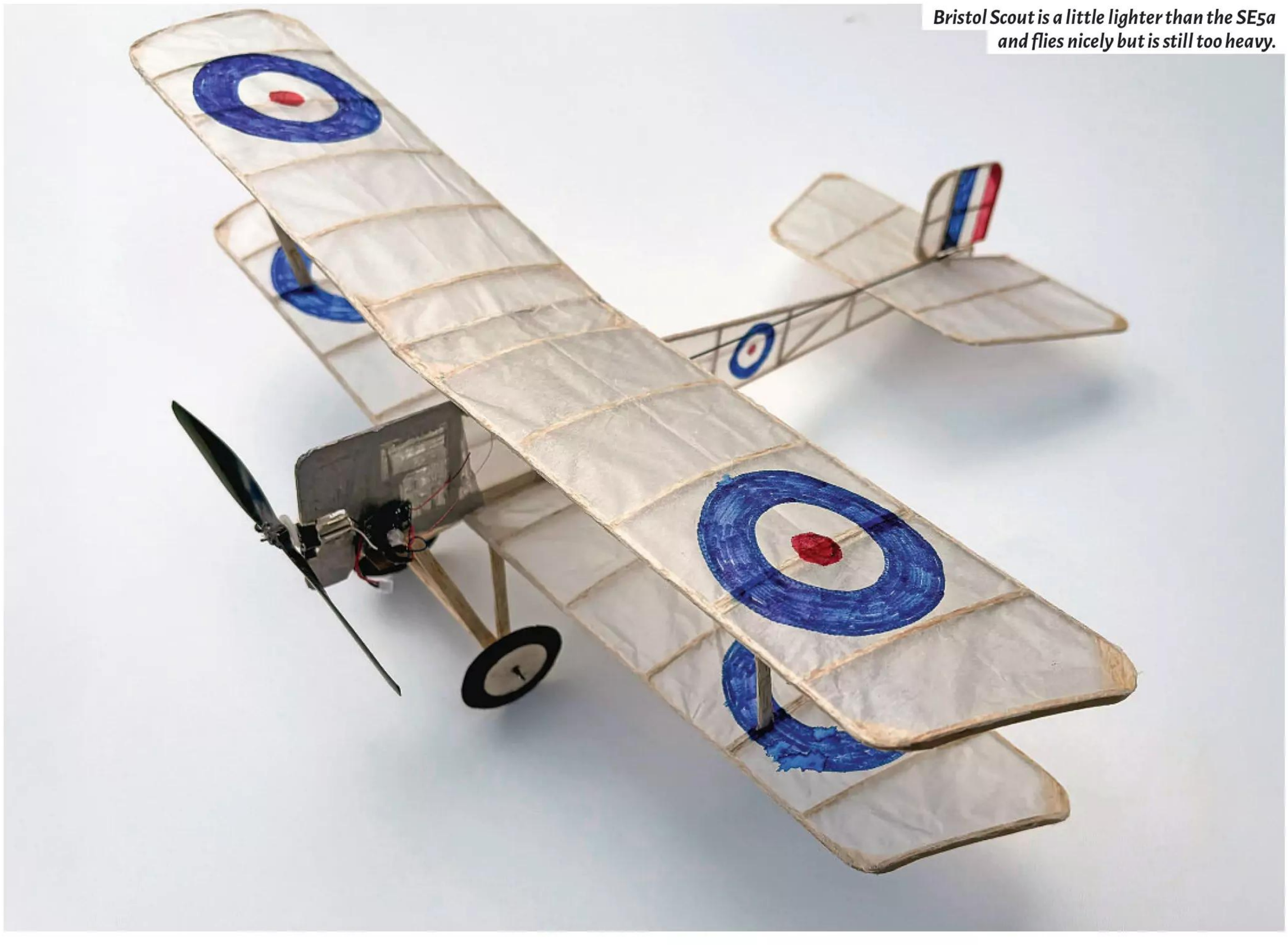
NO-CAL WEIGHT LOSS CONTINUED

In a recent edition of Insider, I was enthusing about my No-Cal RC models. These little planes have a lot to recommend them. Firstly, they are at home in almost any indoor flying spaces and can flit around happily with some other types of R/C and F/F models, with caution, of course. Secondly, they are a low budget way of building when you consider the cost of many micro size R/C indoor kit models. I reckon an airframe could cost less than £1 and the motor, Rx and actuator costs less than the next size up in micro-R/C gear.

These models are very addictive and kitchen table model making has its benefits. However, if the AUW cannot be kept to around 8 to 9 grams, the 4 mm motor does not provide enough power. At higher weights a bigger motor is required and while the model will fly it will not be in the delightful No-Cal way. Although the SE5a had these issues I had a plan for a Bristol Scout and thought this simpler design might be more practical. Unfortunately, it still needed

John's foam Lancaster foam fuselage under construction.

No roll controls on the Mk. 1 but it's now converted to include ailerons.



Bristol Scout is a little lighter than the SE5a and flies nicely but is still too heavy.

Shown next to a peanut size DH 6 the Scout looks big!

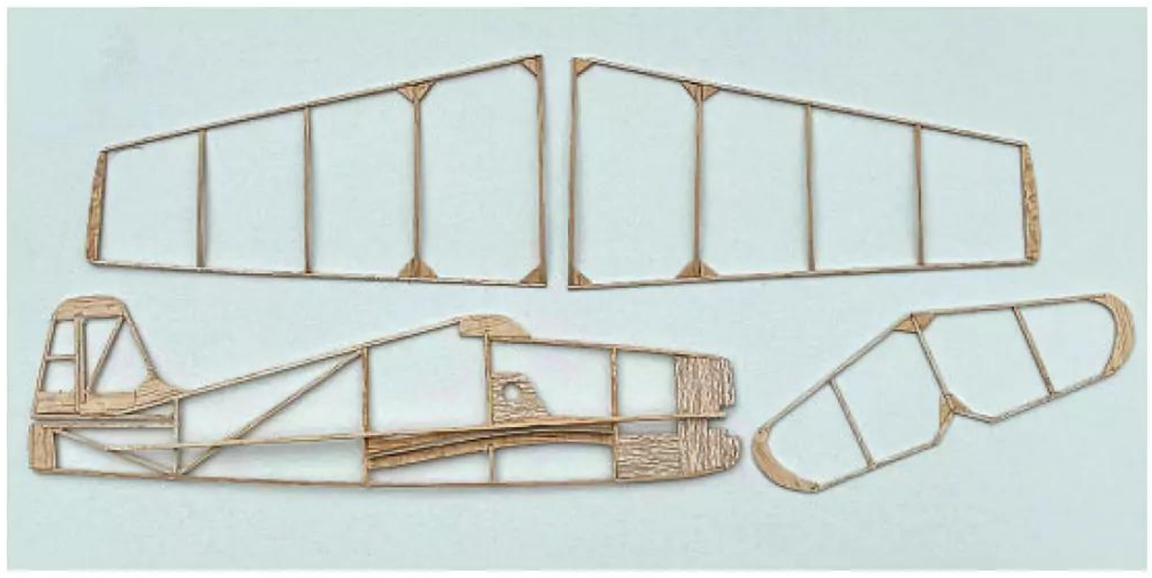
I was hopeful with the Piper Cub. But additional nose weight increased the AUW.

"I decided to return to monoplanes with the hope of achieving the desired No-Cal performance"

a bigger motor and a larger 1S 180 mAh LiPo to sort the power and C of G. At a 17.5 g flying weight it performs well as a micro indoor model but it's not definitely not a No-Cal!

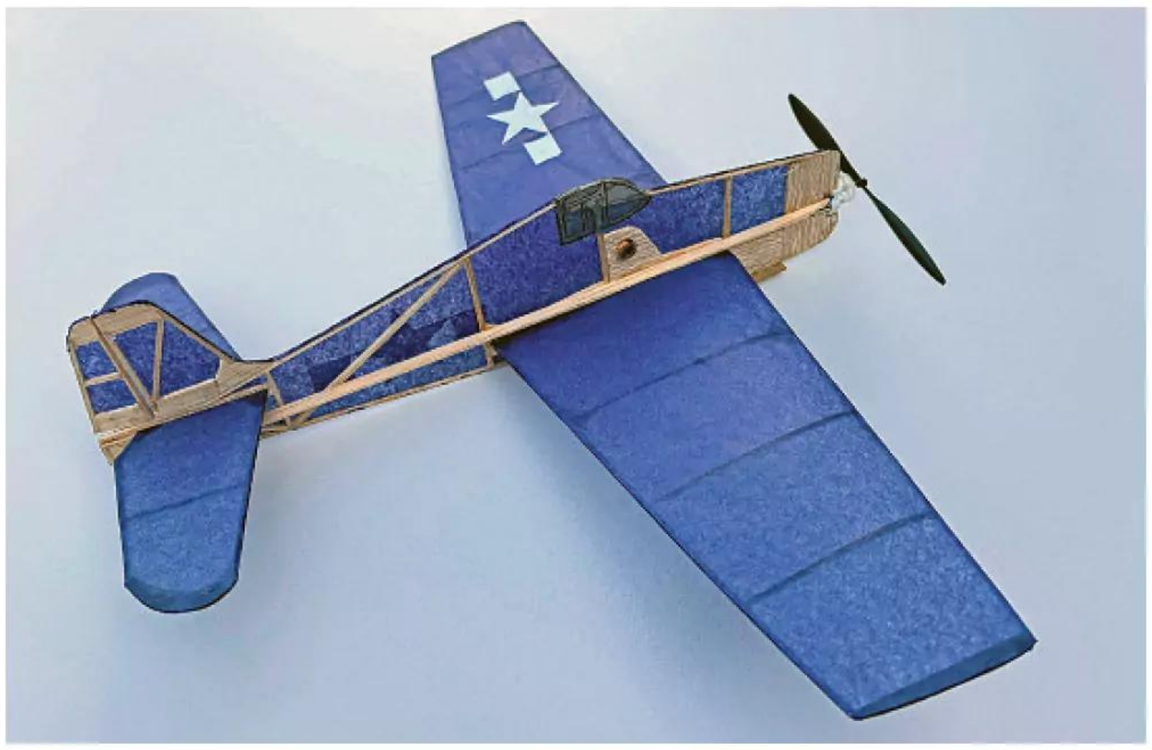
I decided to return to monoplanes with the hope of achieving the desired No-Cal flying performance. I chose a Piper Cub and the model looked promising. But final trimming showed that I could not achieve the correct C of G by battery weight alone. Sadly, 3.5 g of nose weight had to be added, plus a bigger motor. With a flying weight of 16 g, it looks nice but still did not achieve what I had hoped for.

I wondered if I had more chance of achieving this with low wing monoplane designs. There are plenty of plans for these and I chose a T-28 and a Hellcat. They were interesting to build but in addition to the usual 1/16" balsa sheet areas for the motor, Rx and actuator mounting, I had to stiffen up the wings on the T-28 with some cross bracing. They both looked good, but I had to resort to the larger motor option and although not



Hellcat framework showing how minimal it is.

The T-28 and Hellcat were interesting to build but, again, both were just that bit too heavy.



The model is only covered with tissue on one side.

Synergy and the Clik. Check the RC Factory site for the latest version of the Clik.

Practising side on hovering for the Indoor Aerobatic 'B' test.

heavyweights at 14 g for both models, they are harder to trim and less easy to fly. In their original F/F rubber powered form they would have weighed around 6 - 7 g, so I'm double the weight for the same wing area - never a good idea!

So, where do I go now to try to return to the ridiculously light and floaty No-Cals? It's a case of watch this space as it was initially back to the original Prairie Bird design with modifications and then a scale model of one on the slowest flying WW2 aircraft.

INDOOR AEROBATICS

I featured some information etc. from John in the August issue. John flies with two indoor clubs in the Midlands and has detailed knowledge of four others. In five of these six groups the majority of planes are either the Cliks or Synergy type, or something similar. In the other group they have slots.

John is keen to promote the BMFA Indoor tests which, from his experience, help fliers improve their skills and fly with more discipline. This is what John says:

"The Indoor Aerobatics A and B tests were introduced several years ago but surprisingly few know of their existence"

'Some indoor R/C flyers just like to noodle around doing their thing. Others like to push themselves a bit and others like to have something to aim at. Outdoors we have the BMFA A, B and C certificates but how many of you know there are certificates for indoor flying? The Indoor Aerobatics A and B tests were introduced several years ago but talking to many indoor flyers around the country surprisingly few know of their existence. Obviously, they're not for everybody, but for those who fall into the 'something to aim for' category they're certainly a worthwhile challenge. Unlike the outdoor tests, the indoor tests are there to demonstrate aerobatic competence and so are more difficult than their outdoor counterparts. You don't have to prop hang or knife edge for the outdoor B! There's also a significant amount of inverted flying in the indoor B, something that doesn't appear until the Aerobatics C test outdoors. In the Midland Area we've had quite a few flyers passing the A and a smaller number passing the B. It's been very satisfying watching their skills develop as they work towards these challenging certificates.

So, how about it, all you indoor flyers out there? Look up the Indoor Aerobatics tests on the BMFA Achievement Scheme website and maybe give it a go.'

The RC Factory Step One is my FPV 'hack' model. Good fun and easy to fly.

John appreciates that indoor flying activities are very diverse and not all clubs will have either the space or inclination to fly predominantly lightweight aerobatic models. But this style of flying clearly has an enthusiastic following in some clubs.

Just in case you are not familiar with the two models mentioned, both can be viewed in detail on the RC Factory website. These models are stocked by firms in the UK when available. There are two versions of the Synergy and the Clik 21. These are extremely well-made kits but, of course, only provide the materials for the airframe. However, the motor, ESC and servos are not of the 'exotic' type so equipment costs can be minimalised.

An ideal flying weight is around 120 g. My original Clik, with quite a few flights logged and a few repairs, now weighs 145 g ready to fly using a 2S 450 mAh LiPo. This model flies quite slowly and is very manoeuvrable. The lightweight construction of this type of model means that it can really only be flown safely with models of the same type and with pilots of the same mind set! Our 'all foamies, free-for-all' slots are a no-go zone!

Hot news is that a new version, the Clik 25, has been developed. More on RC Factory indoor specials later, but if what you want is unavailable from UK stockists you can purchase directly from RC Factory. They are very helpful and can tell you the postage costs before you order.

STEP ONE BABY

Before we leave the RC Factory, what is a Step One Baby? Well, we will have to go back to look at what a Step One is first as clearly this model is it's offspring! The Step One is my model of choice for hassle free FPV flying. It is easy to fly,

Kit artwork for Step One Baby. Read all about the birth and christening next time!

very stable and practical. As can be seen by the photo, it has a foam construction and a high wing of 850 mm wingspan. Mine weighs 267 g ready to fly. That's with a 3S 450 mAh LiPo for the motor and a 2S 400 for the camera.

The Step One Baby has been introduced as an unconventional micro model and is designed for twin motor, proportional throttle steering and no control surfaces. With a wingspan of just 500 mm, she is suitably small and the target flying weight is just 35 g. The clip of it flying is taken outdoors but mine is destined, hopefully, to have a dual indoor/outdoor role.

By the time for my next column the Step One Baby will have fledged and taken its first flight. I'm hoping for a good indoor and outdoor performance from this little model. ■

MODELLING THE BARLING BEAST

Jon Harper details his research and scratch build of a 72" wingspan model of the six engine 'Barling Bomber'

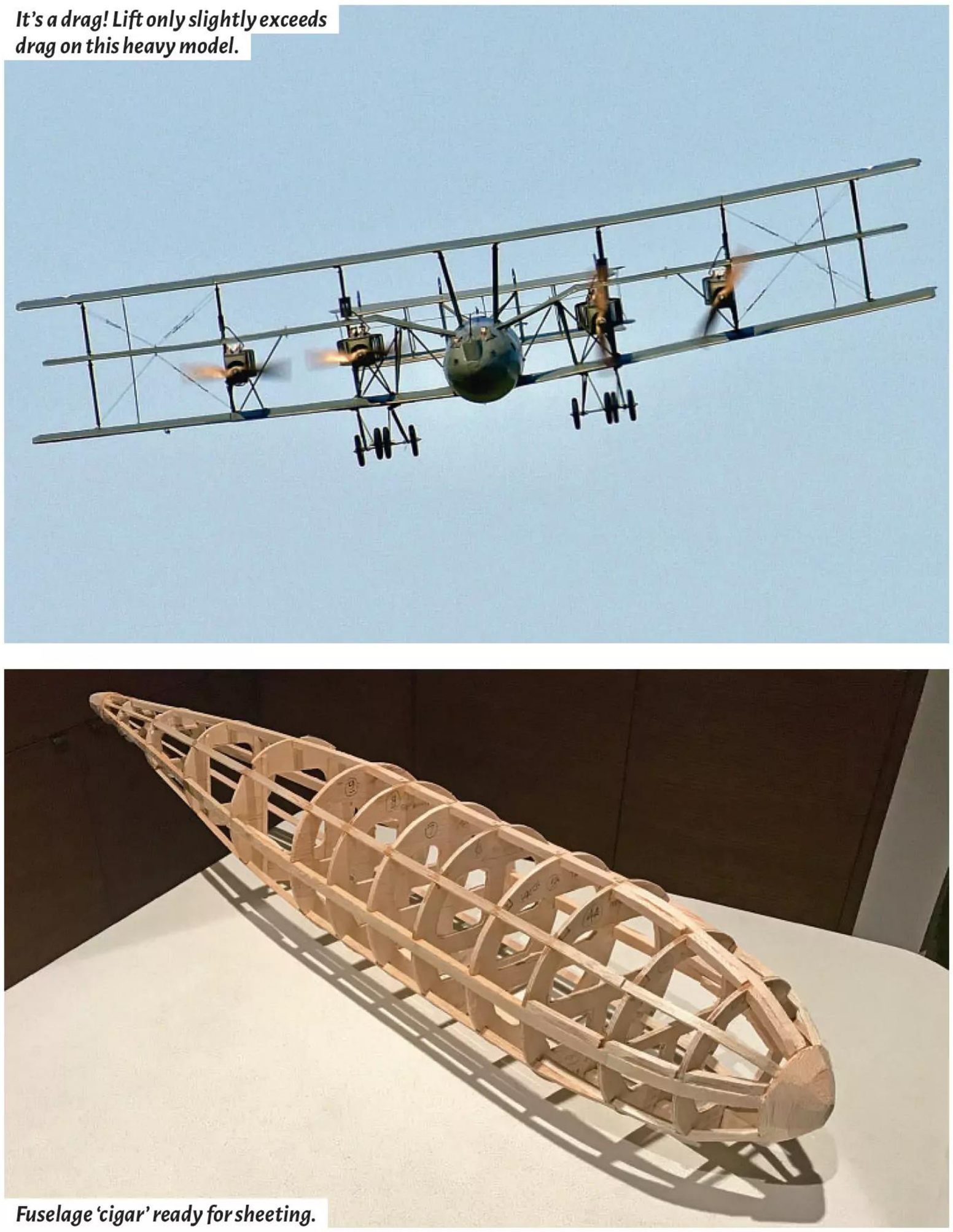
Words **Jon Harper** Photos **Jon Harper, Chuck Clark**

Having successfully scratch built some twin-engine biplanes, I felt ready to take on a really challenging build. A few years ago, my daughter bought me a 1965 Air Classics magazine that included a Barling Bomber article, which enticed me to make a scale R/C model. Its proper name is the Wittemann-Lewis XNBL-1 (experimental night bomber long range) 'Barling Bomber', lovingly named after British designer Walter H. Barling.

Initially lauded as an aviation advance, the Barling quickly became disliked by its pilots because it was exhausting to fly. Enthusiasm waned further once it was realised that it needed an expensive hangar to be built to house it. The coup de grâce for the Barling came in 1925 when it was invited to the west side of the Appalachians, but the Barling had to turn back due to lack of power because it had not been 'up engined' as planned by replacing the original 420 hp Liberties.

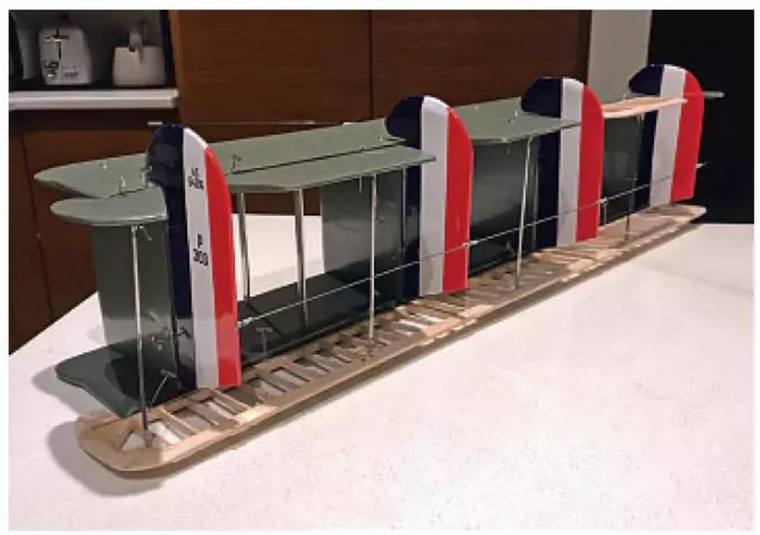
The February/March 1963 Air Progress magazine contained exquisite 3-views by Jim Morrow that provided shape, scale and essential dimensions. A 2015 Air Classics article described the challenges faced when building and flying the Barling, the largest plane built in the 1920s. The initial contract was to build two Barlings for $250K each. Cost overruns pushed the first

Jon has real affection for ugly aeroplanes, or 'nugly planes' as he calls them. The Barling Bomber certainly fits this description!



It's a drag! Lift only slightly exceeds drag on this heavy model.

Making up formers for the rear fuselage.



Covered and uncovered views of the mighty box tail.

Fuselage 'cigar' ready for sheeting.

aircraft's cost to $500K, causing the cancellation of the second airframe. The first prototype had registration number AS64215 and the second was to be AS64216, which I adopted for my model. W. H. Barling's 1925 patent description provides his opinion of what made his design special. A glowing description can be found in a 1925 Flight magazine that included interior photos as well as engine and bomb aimer station close ups. An online vintage Barling maiden flight movie was also found, documenting some obscure portions of the plane.

WHAT'S NOT TO LIKE?

The Barling has the following scale characteristics:

- Two pusher and four tractor engines (six Liberty 12A, 420hp)
- Nose over training wheels and eight landing wheels
- 2 1/2 wings, including a semi gull mid-wing
- Box tail with four vertical stabs and rudders, plus six-part elevator
- Crew of up to nine, including gunners
- 120-foot wingspan
- Lacked power to crest the Appalachian Mountains
- Had a flight duration time of one to three hours
- Cruising speed 61 mph (max speed 95 mph)
- Range of 170 to 335 miles
- Number built and flown: one. This model is number two!

INITIAL DESIGN THOUGHTS

The Barling would prove to be a difficult build with its semi gull mid-wing between the two main wings and a complex box tail. Normally, I prefer 1/12 scale but that would yield a 12-foot wingspan. I considered 1/24 scale, resulting in a 60" span, before settling on 1:20 scale and 72" span. With the scale decided the 3-view drawing was sent for printing and a vinyl decal order was placed with Callie Graphics. Three weeks later a set of graphics arrived for encouragement.

The 3-view drawing noted an RAF 15 aerofoil. This aerofoil was a structural compromise, with depth maximised for spars, enough camber for a decent CLmax and a thinner section to minimise drag. I decided on a thickened Peter Rake profile because I understand its behavior.

The nose 'training wheels' resulted from a bad experience with Barling's huge Tarrant Tabor flipping over and killing the pilot on its taxi/flight test. However, the 'training wheels' proved superfluous and were removed.

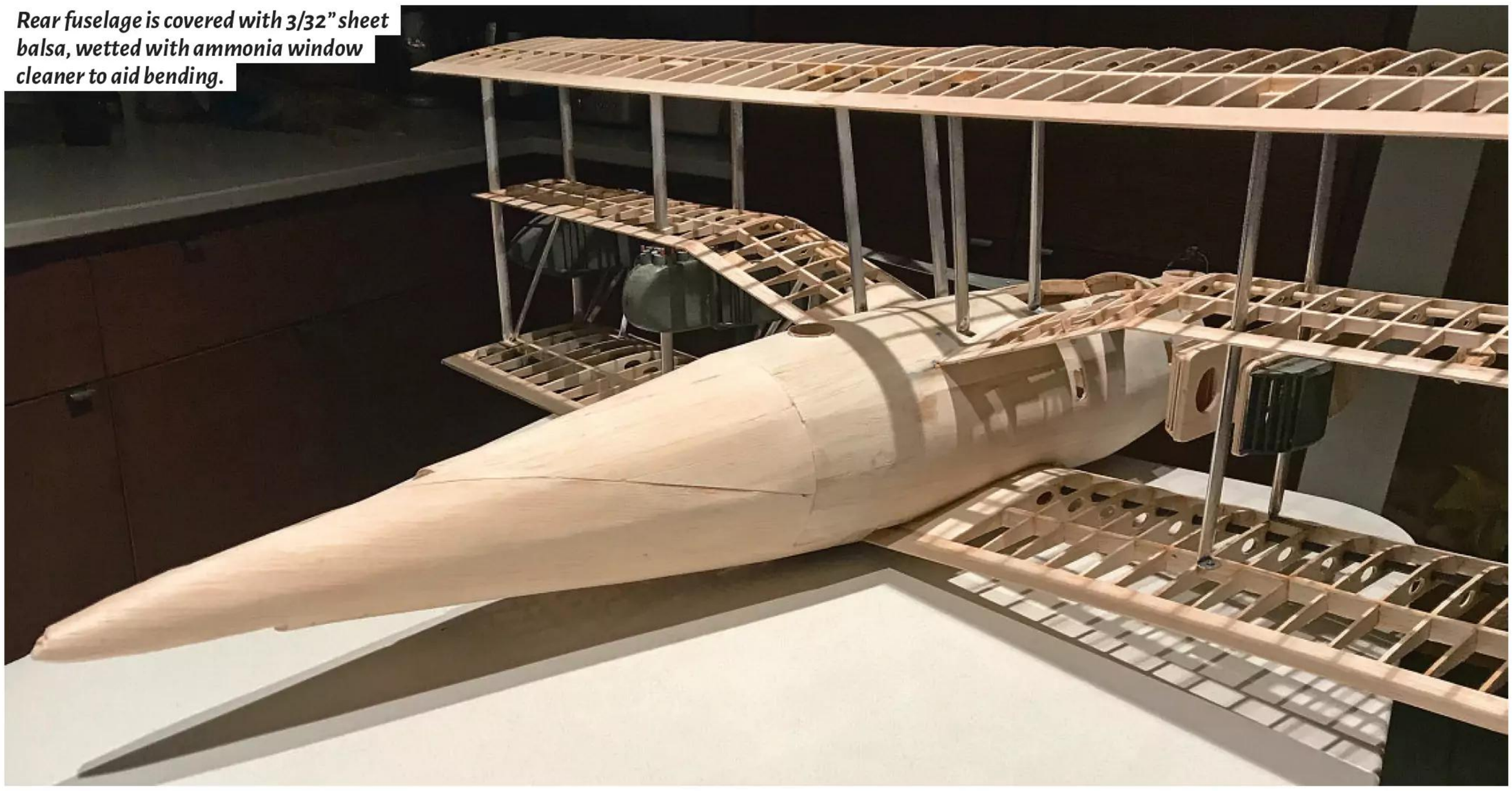
A three-compartment bomb bay with doors (the first of its kind) was located near the aircraft's Centre of Gravity.

> "The nose 'training wheels' resulted from a bad experience with Barling's huge Tarrant Tabor flipping over"

STARTING WITHOUT DRAWINGS!

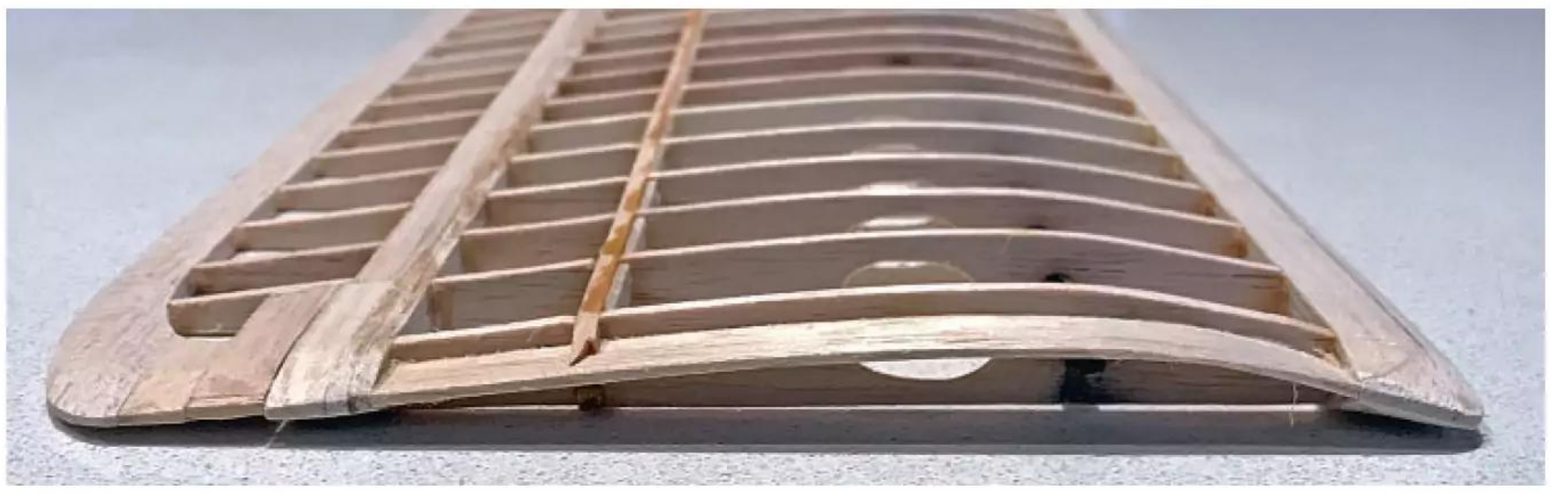
Fuselage construction was started before the enlargements arrived from the printer. Once the drawings arrived the fuselage was found to be off by quarter of an inch in length!

Since fuselage profiles were not available, fuselage formers were sketched out by

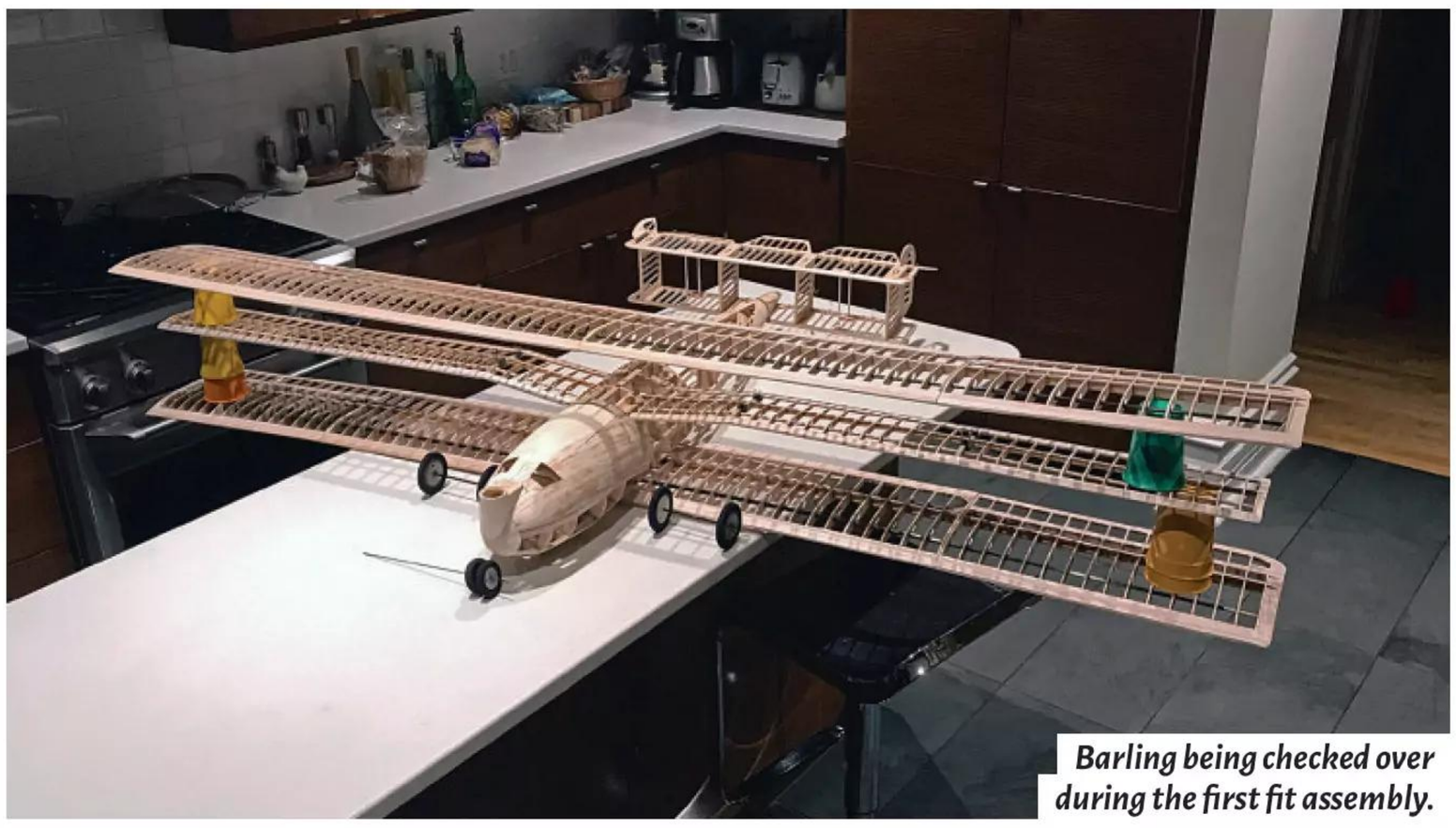


Rear fuselage is covered with 3/32" sheet balsa, wetted with ammonia window cleaner to aid bending.

Wings in build. That's a lot of ribs!



Wing tip detail.



Barling being checked over during the first fit assembly.

guessing profiles using historic photos to capture the elegant fuselage shape. Central 'cigar' cylindrical formers were mass-produced using 5/32" plywood for the four formers that take the wing or landing gear loads. Other formers were made from double laminated 3/32" balsa with their wood grain at 90° to each other to reduce the risk of grain fractures and to reduce tail weight. Notches were cut for spruce stringers (3/16" x 1/4") at four quadrants, with intermediate balsa stringers (1/4" x 1/4") to support the fuselage's 3/32" balsa sheeting. After sheeting, flashlight candling was used to locate the blocks for the landing gear, wing screw fasteners and tail struts. A handheld belt sander was used to roughly sand the fuselage stringers, followed by a sanding block to fine tune the shape. No fuselage parts or fingers were damaged in the process!

BOX TAIL

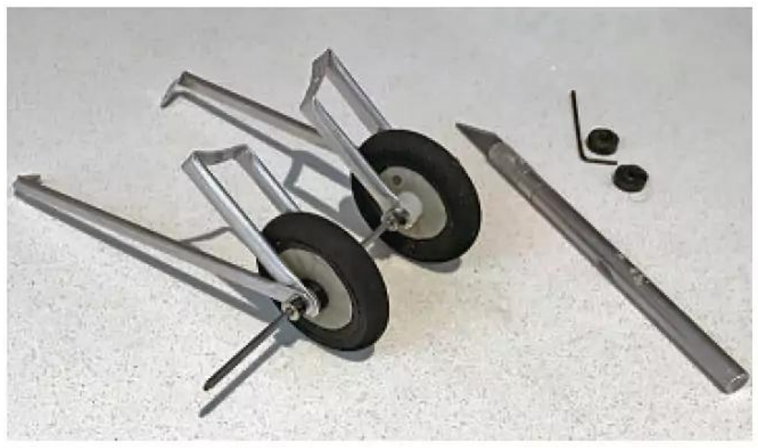
The box tail structure was sketched on the 3-view drawing, marking the tie point blocks. Various sized balsa strips were used to form tail feather borders. The five separate upper elevator segments are connected to the continuous lower elevator and operate together using 1.5 mm diameter vertical aluminum tubing with looped wire ends. They are hinged using CA hinges.

The main tail parts were test fitted, then sanded to shape. Discrete screws hold the box tail together, with diagonal aluminium aerofoil struts allowing for disassembly should the unspeakable happen. Piano wire linkages connect to each rudder trailing edge, operating all four rudders simultaneously.

Mounting of the tail is awkward since it is fixed to the underside of the fuselage's slender rear tip. Screws were used to secure the removable box tail and fasten the fixed tail skid supports.

FUSELAGE SHEETING

Before planking the fuselage, photos were taken of the basswood block locations for the spar and landing gear connections so that fastening screws could 'find' them later. 3/32" x 1/2" balsa planking is used on the forward fuselage due to the curves. The rest of the



'Nose over' training wheel brackets are constructed of aluminum aerofoil stock, bent to a U-shape, with piano wire axles.

Nacelle detail. Note the simulated wood effect on the APC prop.

Close up of one of the dummy fuel tanks, made from thin card and balsa.

fuselage is covered with 3/32" sheet balsa, wetted with ammonia window cleaner to aid in bending. The sheeted 'cigar' was given an overall sanding to smooth out any blemishes.

Window and cockpit openings were cut in scale locations. The battery hatch was cut out of the fuselage after sheeting to ensure a perfect fit.

The nose turret assembly was trimmed for a tight fit to the curved fuselage nose and glued in place.

LOTS OF RIBS

Once the aerofoil was finalised the location of spars and stringers were set. Aerofoil CAD files were prepared and sent out for CNC cutting. The CNC ribs were very uniform, only requiring adjustments at the aileron, landing gear and engine mount locations. Each wing panel has strategically located 1/8" ply ribs for the engine mounts, strut locations, and wing panel ends. The top wing has no dihedral, the mid wing meets the fuselage in a gull wing, and the bottom wing has 2.5 degrees dihedral.

Half the number of scale ribs were used. Even so there are about 230 ribs! Balsa leading and trailing edges were sanded to approximate profile. The entire wing assembly extends

Ten wheels on my wagon!

through the fuselage and connects to the other wing with 1/8" ply plates. The mid gull wing connection angle was set using a 2.5 mm dia. connector wire bent to the correct angle and glued into a carbon fibre tube wing sleeve on each side.

The stacked three wing outer wingtip panels are fastened using carbon fibre tube sleeves to receive thinner carbon fibre connector rods. They are then slid onto the central wing box assembly and held in place with flying wires and turnbuckles.

Aileron servos were installed in the outer lower wing panels, with blocks for the aileron couplers and control horns. Two horizontal 45-degree gull wing braces were fabricated from aluminum aerofoil section and built-up balsa.

> "Half the number of scale ribs were used. Even so there are about 230 ribs!"

FIRST FIT & WEIGH-IN

Major components were temporarily assembled to see if the proportions were right. The wings were still floppy but would tighten up with covering, struts and flying wires.

A weigh in was carried out and pointed to an AUW of about 3500 g or 7.6 lbs., including allowances for covering and batteries.

STRUTS, FLYING WIRES & WING INCIDENCE

All struts were sized, starting with the central wing box, which was screwed together to provide a solid base. Heat shrink tubing was used as strut grommets to prevent the flying wires from being cut by the sharp aluminum strut holes.

Wing incidence angles were set at the same time as the dihedral, which was a geometric origami exercise. In the end the TLAR (That Looks About Right) principle was used, with a few measurements taken using an inclinometer for cross checks.

WHEEL TRUCKS

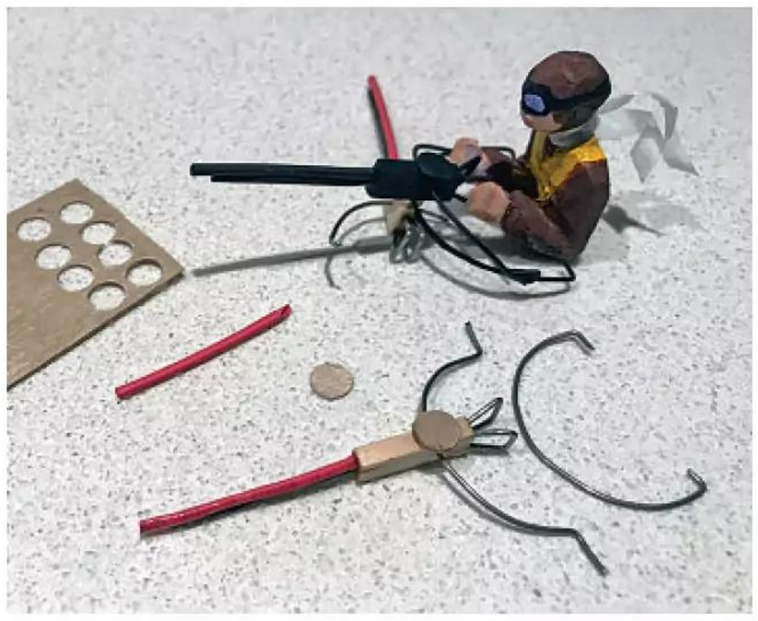
Lightweight wheels were sourced but did not have a period look. So, a thin sheet aluminum disk was cut and installed over each wheel rim, complete with a nail hole for valve access, then weathered with artist Conté crayons to simulate canvas covers.

The nose over training wheel bracket is constructed of aluminum aerofoil stock, bent into a U-shape, with a piano wire axle. The front training wheels were installed with a diagonal strut providing a forward cant. The tail skid assembly was made from 1.5 mm dia. piano wire, flattened aluminum and brass wire retention clips, with a maplewood shoe skid. The aluminium clips for the tail skid assembly were screwed into basswood blocks within the fuselage. The main landing gear trucks required the use of a propane torch to bend 'curlie Qs' to receive the axle. Cross bracing and fake shock absorber thickenings were added on each truck, with O-rings used in the same way that bungee cords were used on WW1 biplanes to allow landing gear flex.

NACELLES & FUEL TANKS

Nacelle sketches were made (referencing historic photos), widening the engine cowl to fit the electric motors. Six mock Liberty 12A cylinder head/ spark plug clusters were made using dowels and balsa bits, with two hollow front cylinders to ventilate the motor compartment. The pusher engines have feathered props to reduce drag. Vertical motor pod gills and discrete ventilation holes help keep the ESCs cool. A vertical wing strut pierces directly through each motor nacelle, pinning it in place.

Cowl nose pieces were cut off and held in place with rare earth magnets for motor



Five crew were carved from pink foam and painted with acrylics. Three Lewis guns and scarff rings were fabricated from balsa, wire and heat shrink tube.

access. Four dummy copper gravity fed fuel tanks (two large and two small) were made from thin card and balsa. They fit between the wing struts. Copper rattle can finish was weathered and black Sharpie rivets applied.

CREW & LEWIS GUNS

A lightweight 1:20 scale crew of five was carved from rigid pink foam and painted with artist's acrylic paint. Together they only add 2 g to the AUW, including their toilet paper scarves! Ledges were installed below to support the pilots, secured with Velcro.

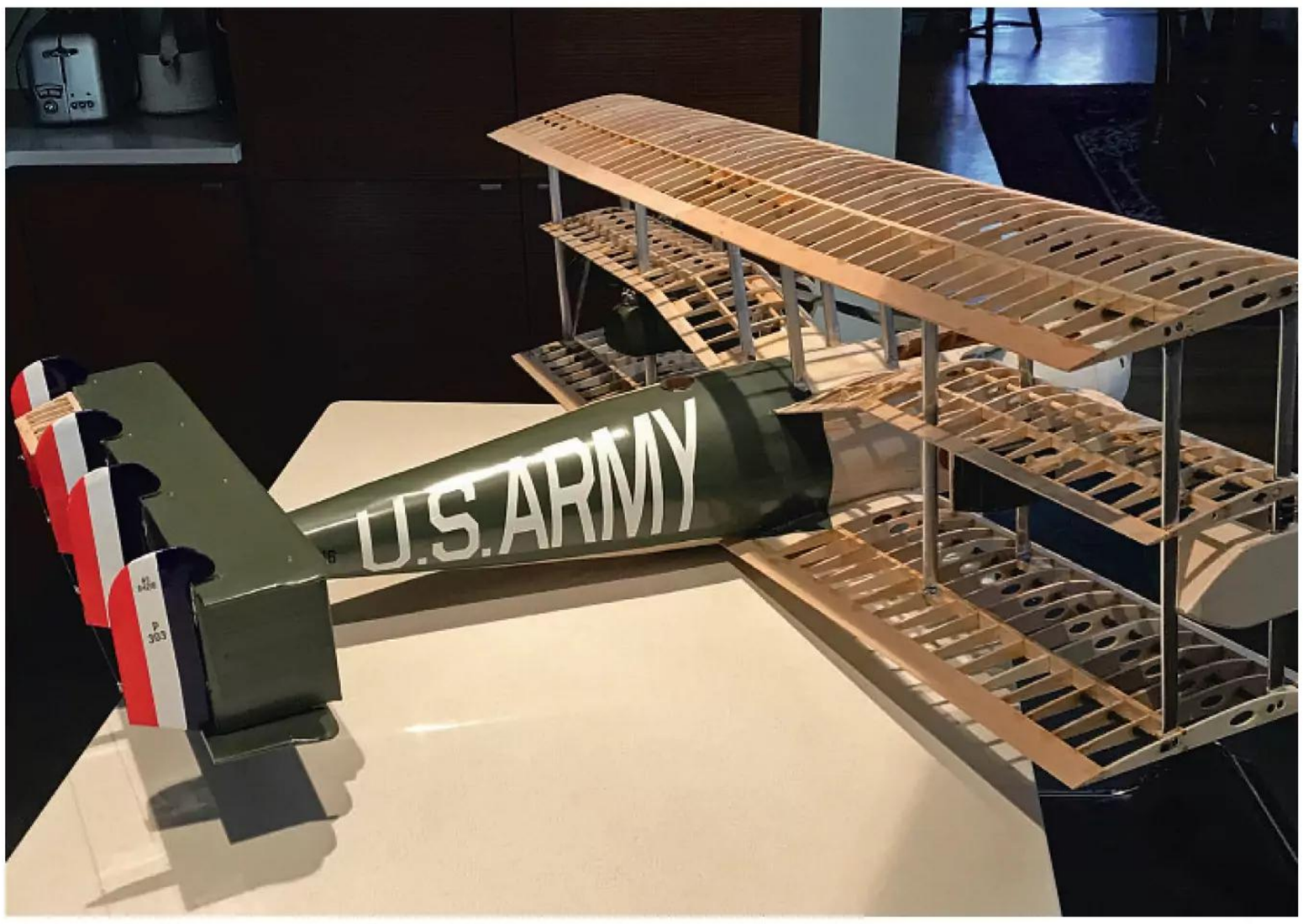
The original Barling included six gunner stations: dorsal, ventral, in front of bomb aimer facing down and forward, nose turret and two waist gunners behind the wing. Three Lewis guns and scarff rings were fabricated from balsa, wire and heat shrink tube.

MOTORS & PROPS

The original target All Up Weight was 8 lbs. with a 72" wingspan. Ecalc tests were run to size props and equipment, assuming a 10.4 sq.ft. wing area generating a 13.5 oz./sq.ft. wing loading. Four 275W E-flite Park 480 1020 kV motors were selected, with 9" x 6" props and 20-amp ESCs, producing 740W peak power or 92W per lb.

To accommodate the 9" diameter props, instead of scale 8" props, the inner and outer motors were moved 1.25" further apart. The props were sanded and sprayed with beige base paint, dry brushed with dark brown/yellow ochre in a wood grain pattern, with clear coat used for prop balancing.

Four crew members get a good view! The fifth is manning the dorsal Lewis gun just behind the gull wing.



Red, white and blue film on the rudders provide the only colour. Matt finish olive drab Monocote was used for the rest of the airframe.

COVERING & BOX TAIL RIGGING

Covering started with the tail feathers. The rudder heatshrink film colours (red, white and blue) provide the only colour on the aeroplane and were fused together using the mirror technique before being applied. The nose was covered next, followed by the wings and ailerons. The matt finish olive drab Monocote was great to work with, shrinking easily and making the wings stiffer.

The U.S. Army logo, American star insignia, squadron number and the registration numbers were applied, officially making the model the 'never built' second prototype.

This tail was six times more difficult than any other tails I have built! It is comprised of 16 parts, all individually covered, with cross braces, flying wires, rudders, vertical stabs and elevator segments. All components had to be connected to function in unison.

> "The tail was six times more difficult than any other tails I have built! It is comprised of 16 parts, all individually covered"

CG & ELECTRICS

The receiver, rudder and elevator servos are accessed via the front battery hatch which helps with the Centre of Gravity. The four electric motors were connected to their ESCs and use multiple Y connectors. One battery was connected to the inner motors and another to the outer motors to ensure battery sag would only stop one motor per side.

Once the landing gear was installed all components were weighed and allowances added for missing items, which pointed to 3644 g or 8.03 lbs. AUW including batteries. Whilst completing the final strut assembly, and after the motors and ESCs were installed, a quick CG check revealed that the two 2200 mAh flight batteries had to be mounted into the nose to get close to a correct balance.

Crewed up and awaiting the maiden flight.

Whoops! After two arrivals Jon wisely handed his bomber over to Dave, a skilled test pilot, to resume the shakedown flights.

Looking majestic as she sweeps in for a fly-past.

If you share Jon's passion for 'nugly' planes, then please send some pictures of your models.

DATAFILE

Name:	Wittemann-Lewis XNBL-1 'Barling Bomber'
Model type:	Scale bomber
Scale:	1:20
Designed by:	Jon Harper
Wingspan:	72"
Wing area:	10.3 sq.ft. (1483 sq.in.)
Target all up weight:	7 lbs. (final AUW 8.7 lbs.)
Wing loading:	Approx 13.5 oz./sq.ft.
Elec motor:	4 x E-flite Park 480, 275W, 1120 kV
ESC:	4 x 20 amp
Power:	85 W/lb. (based on 740W effective output)
Props:	4 x APC 9" x 6" two blade (two counter rotating)
Battery:	2 x 3S 2200 mAh 60C (in parallel)
Functions:	Ailerons, rudder, elevator, throttle
Build hours:	Approx. 340 hrs.

TRIALS & TRIBULATIONS

Taxi test day was very windy, with gusts from 18 km/hr to 28 km/hr, so no flying for sure. Or so I thought...

What followed was an 'accidental' first flight. As I pointed the Barling into the strong wing for a half throttle taxi test a huge gust came through, lofting the aircraft six feet into the air! My spotter said, '*You are committed*', and what ensued was a hair raising first flight. Regaining my composure after several minutes, I was barely able to bring the Barling back in one piece.

Another flight two weeks later ended poorly after a few seconds when I forced the aircraft into the air, causing a tip stall and spiral in from about twelve feet, causing extensive damage to the fuselage to wing junctions. After repairs, lessons learned from the crash were applied, resulting in... Another wild flight and crash after about 30 seconds! The apparent cause was that lift only slightly exceeds drag on this heavy model. Throttle must be above 60% or gravity wins. To reduce drag all unnecessary flying wires, the nose wheel assembly and crew were removed.

After two crash events I turned to skilled test pilot Dave Rees, who had it flying well after two flights and provided me with written flight instructions! Subsequent proving flights have shown the Barling to be quite flyable (for a high intermediate pilot), looking majestic in the air. Not bad for the second flying prototype.

Come on, build something ugly and see what happens! ■

ANGELWING SOAS

***Jeff Barringer** reports from the other side of the world after building a rather quick slope soarer*

Words & Photos **Jeff Barringer**

It's been estimated by the University of Sydney that Australia is home to approximately 12,000 beaches. To put that in perspective, if you were to visit a different beach every day it would take you nearly 29 years to set foot on all of them! More importantly, if you happen to enjoy slope-

A quick shove is all that's needed.

What a great slope soaring site!

soaring, many of those beaches have accessible cliffs from which you can launch and then, if necessary, hike down to the bottom in the unlikely event that things don't work out how you wanted! Having travelled to Australia many times to visit our son Adam, we've tried a fair few of them and one of our preferred locations is the Long Reef on the northern beaches of Sydney.

Just after booking our flights for our 2024 visit a clubmate brought along a SOAS kit to one of our club meetings. He had previously built other kits from Angelwing Designs and was very impressed with the kit quality and I have to say I was too.

SOAS, for the purposes of this august publication stands for SOIL ON A SPADE, although other epithets have been mentioned! Promising a well-thought-out design, a high-quality kit, easy build and, most importantly, a model which could easily be

"The model is very well thought out and the fit of all the parts superb"

housed in a small wing bag tucked away inside a travel suitcase, I decided to buy one, build it in time for our trip and leave it with Adam on our return to the UK.

SOAS BUILD

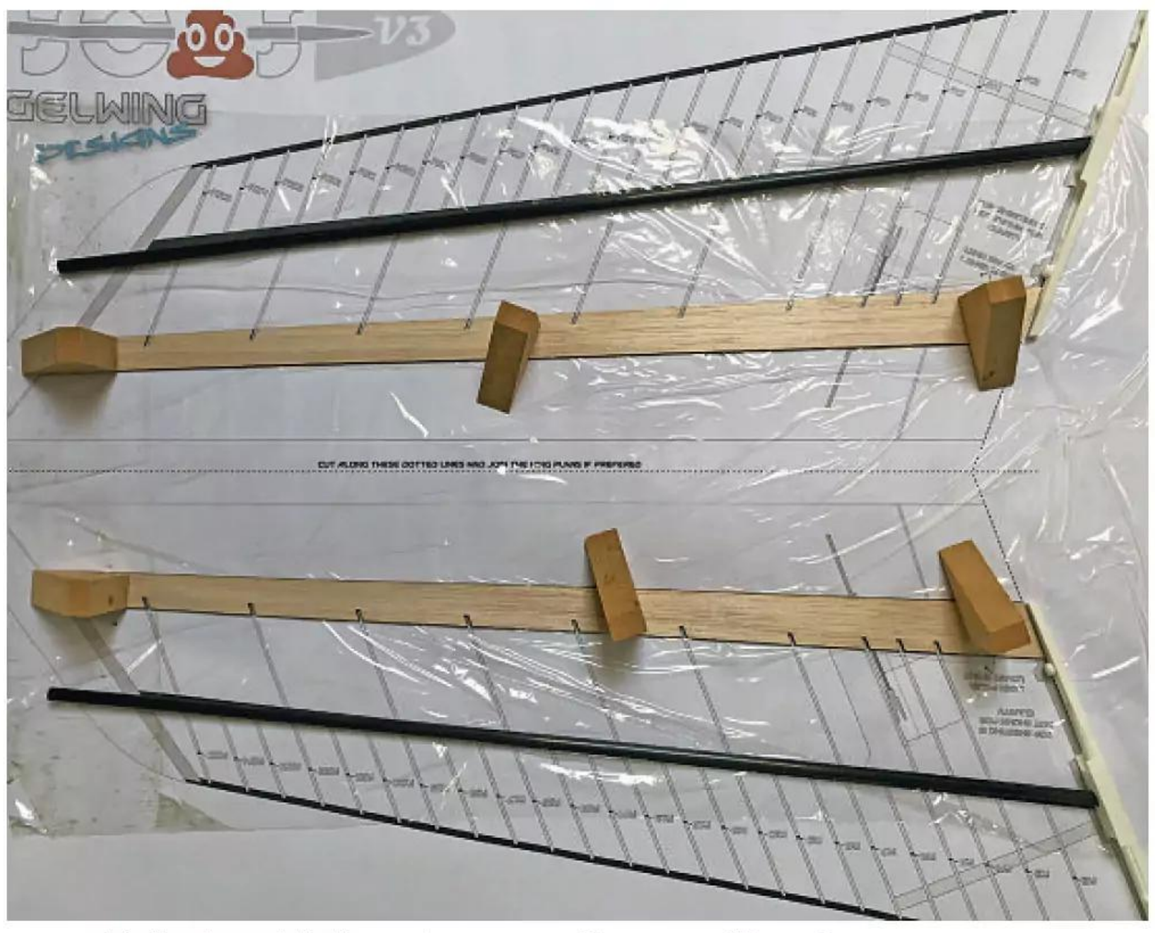
The kit comprises a clear, printed plan, a selection of high-quality balsa ribs, trailing edges and wingtips, carbon fibre main spars, leading edge and dihedral brace, 3D printed parts, button magnets and a fun selection of decals. Instructions are downloadable from the internet.

If you've built other kits, I think you'll find building an SOAS straightforward, although I would urge you to read the instructions a few times to fully appreciate how she goes together. It is particularly important to align the carbon fibre and aluminium wing tubes to ensure that the completed aircraft fits together over the 3D printed 'fuselage'.

Using cyano for the plastic parts and wood glue for balsa she goes together very quickly indeed. For me it took approximately 12 hours spread over a week. The model is very well thought out and the fit of all the parts superb. The first time you assemble the machine and feel the embedded magnets pull it all together is a delight.

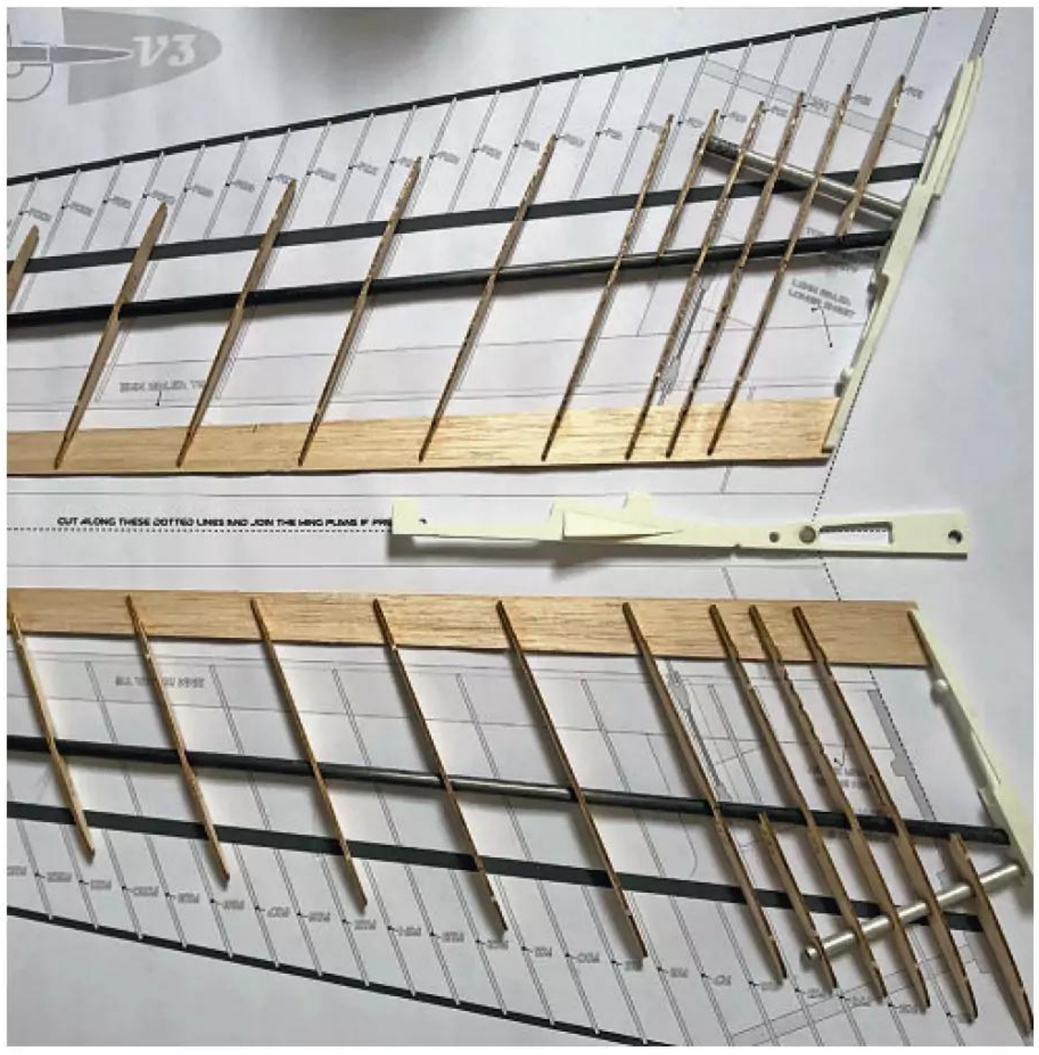
The appearance of the model is to my mind greatly enhanced by the visible ribs and riblets, so I decided to cover my SOAS using laminating

A spread of the parts, plan and decals supplied.



Assembly begins with the main spars and lower trailing edges.

Balsa parts are neatly cut.



Main ribs added as per the plan.

Sub ribs added.

film, a semi-transparent material which sits very well against most skies. Interestingly, the elevons are bottom hinged using the covering material, which I was assured added to the performance of the aircraft due to its wing profile.

The supplied decals are high quality and particularly easy to apply. The only things I didn't like were the elevon linkages which rely on fiddly plastic to piano wire joints. So, I used my own tried and tested method involving two runs of piano wire and heat shrink tubing, as shown in a nearby picture.

FIRST FLIGHT

The set-up instructions for the SOAS detail all control throw movements and suggest the use of a considerable amount of exponential in each. I'm no fan of expo and neither is Adam, but we duly programmed the radio to accommodate it. The model balanced with a very slight nose-down bias when supported at the provided notch on the fuselage, requiring no ballast.

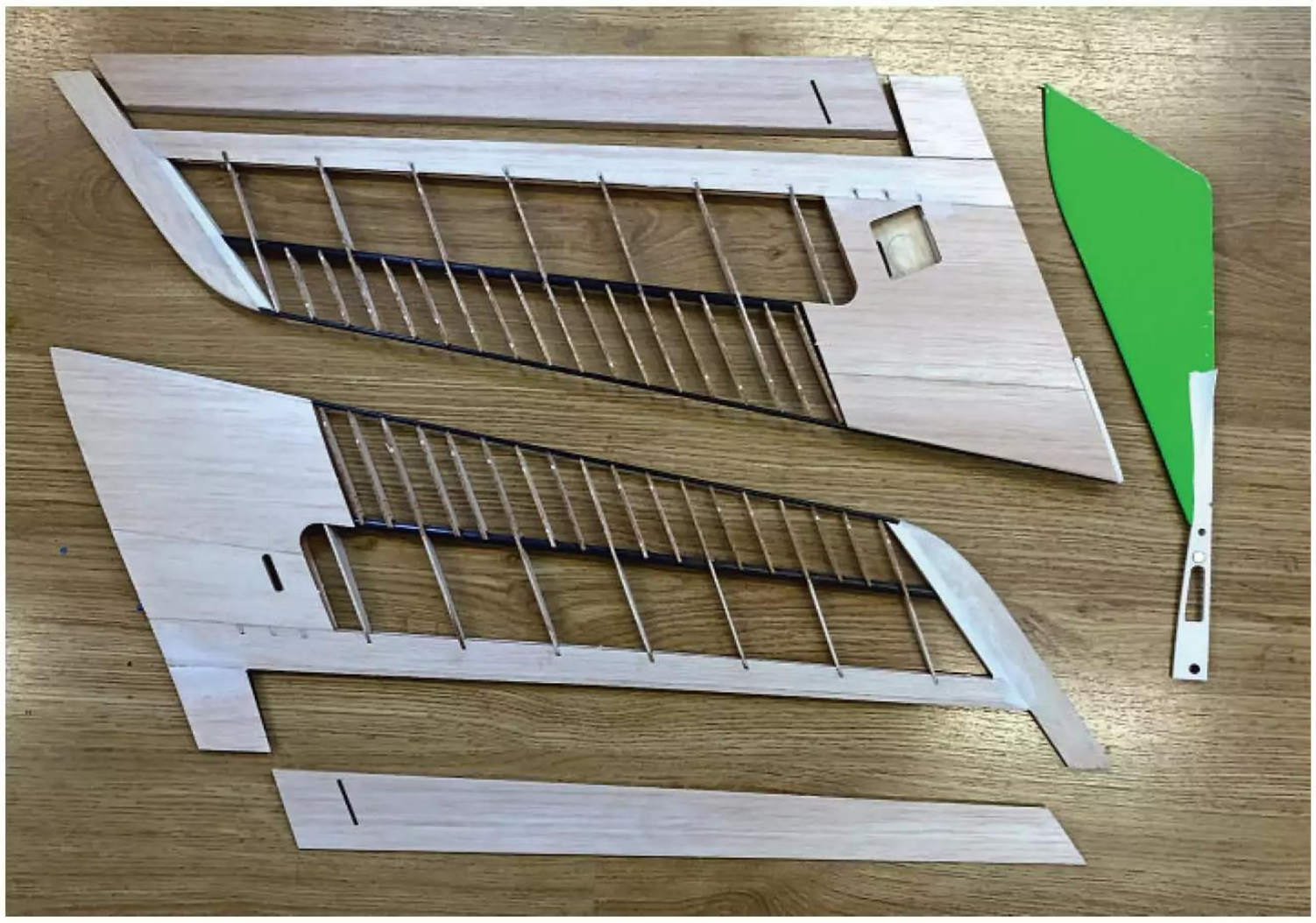
Within a couple of days of arriving in Oz a favourable wind brought us to the Long Reef. Having negotiated with a group of paraglider pilots, we took our place at the top of the cliff, about 200 feet above the sea and benefitting from a slight bowl. We had a perfect north-easterly wind of about 15 - 20 knots and a fetch of 7000 miles - the next landfall was Santiago in Chile! These windy conditions highlighted the slightly fiddly assembly of the model (the servo wires and the Rx are tiny) so next time we'll do it in the car.

As a means of comparison, we initially flew a trusty foam-based wing which coped well enough with the conditions but whose performance could not by any means be described as spectacular, particularly when turning through the wind.

The SOAS was launched from a simple finger hold on the nose and allowing her to fly away. She immediately fell into a fast stable gentle descent, pushing out at a fantastic rate. A few clicks of back trim had her sorted and then she settled into being a sky-eater, climbing willingly and turning predictably with no height loss or gain and impressive conservation of momentum. The colour scheme worked well, being highly visible and with great clues on orientation, particularly from the hi-vis fin. Talk about being a confidence builder!

Within a couple of minutes Adam was comfortable to try the close-in performance, passing within a few feet of us and then wheeling around in a frankly outrageous series of passes and pull-ups, both fast and slow,

It is important to align the aluminium wing tubes correctly.



Completed wings and central spine. Just the elevons to attach.

One of Jeff's preferred control linkages.

A pair of club SOAS kits in build.

yielding whoops and hollers from onlookers and pilot alike.

Our key observations at this point were:

- Wow, this thing really performs!
- Elevator response was insufficient and not in balance with the performance of the wing, particularly in high-speed carved turns.
- The expo on controls took away from the predictability of the aircraft, at least to our taste.

We therefore voted to bring her in for a landing (easy) to remove all the exponential. We also increased elevator throw to 6 mm. Reflex was 1 mm, as recommended.

Rates (mm) were now:

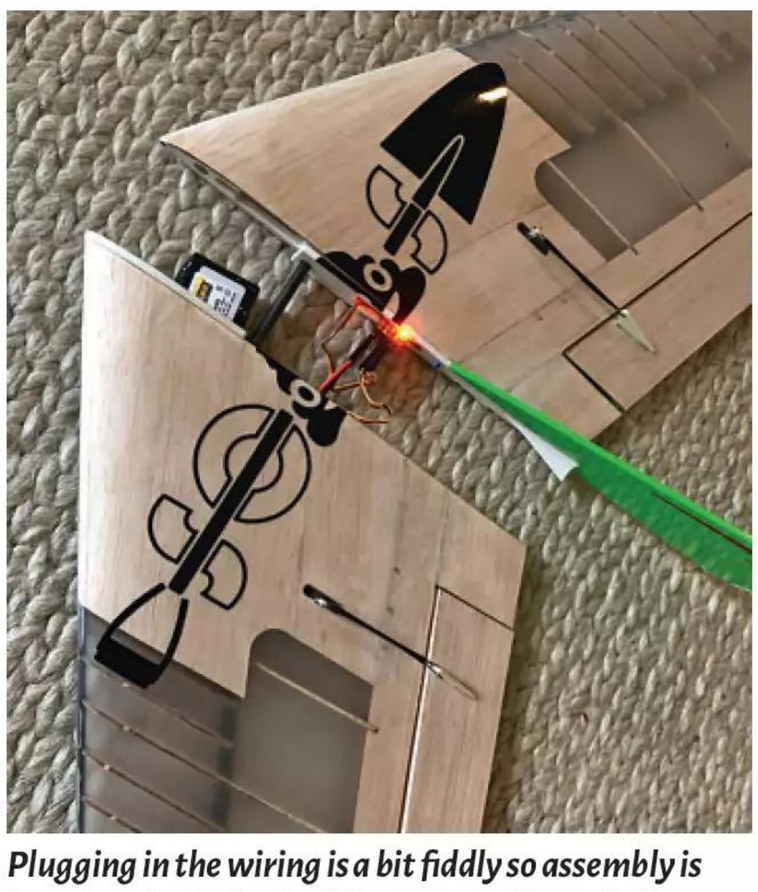
	Rate 1	Rate 2	Rate 3
Aileron	8	7	6
Elevator	6	5	4

Upon re-launch our adjustments were immediately validated. She was even better, punching out like a scalded cat and handling nimbly over a wide speed range. The proportionality of elevator and aileron response was bang on and high-speed carving turns were now a thing of joy.

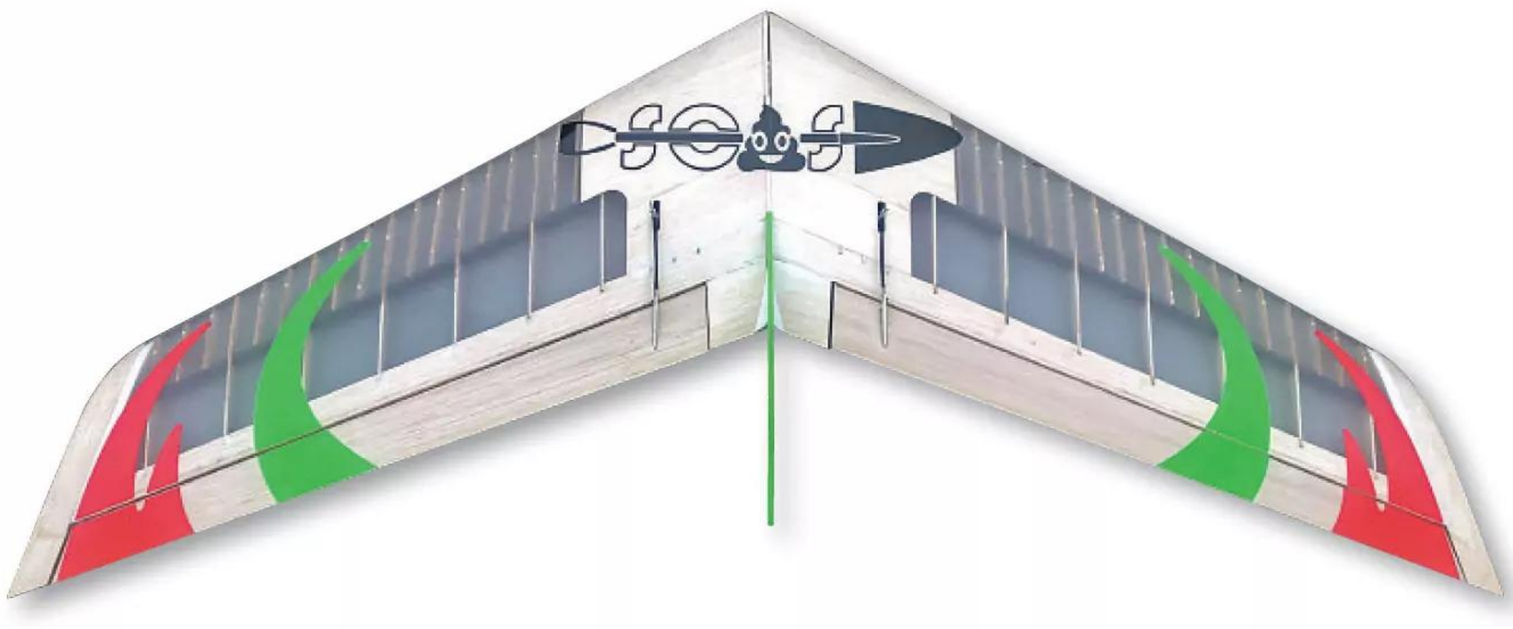
SECOND FLIGHT

Our next foray was from a cliff up by Byron Bay, with a 10 - 12 knot easterly breeze. After feeling the wind again with our foamie, once again the SOAS went away readily from a simple release into wind and climbed to a height easily double that of the cliff (about 200 feet). The wind was noticeably lighter than our first flight but with mid-rates selected for both aileron and elevator she was again remarkably agile, but smooth and confidence building.

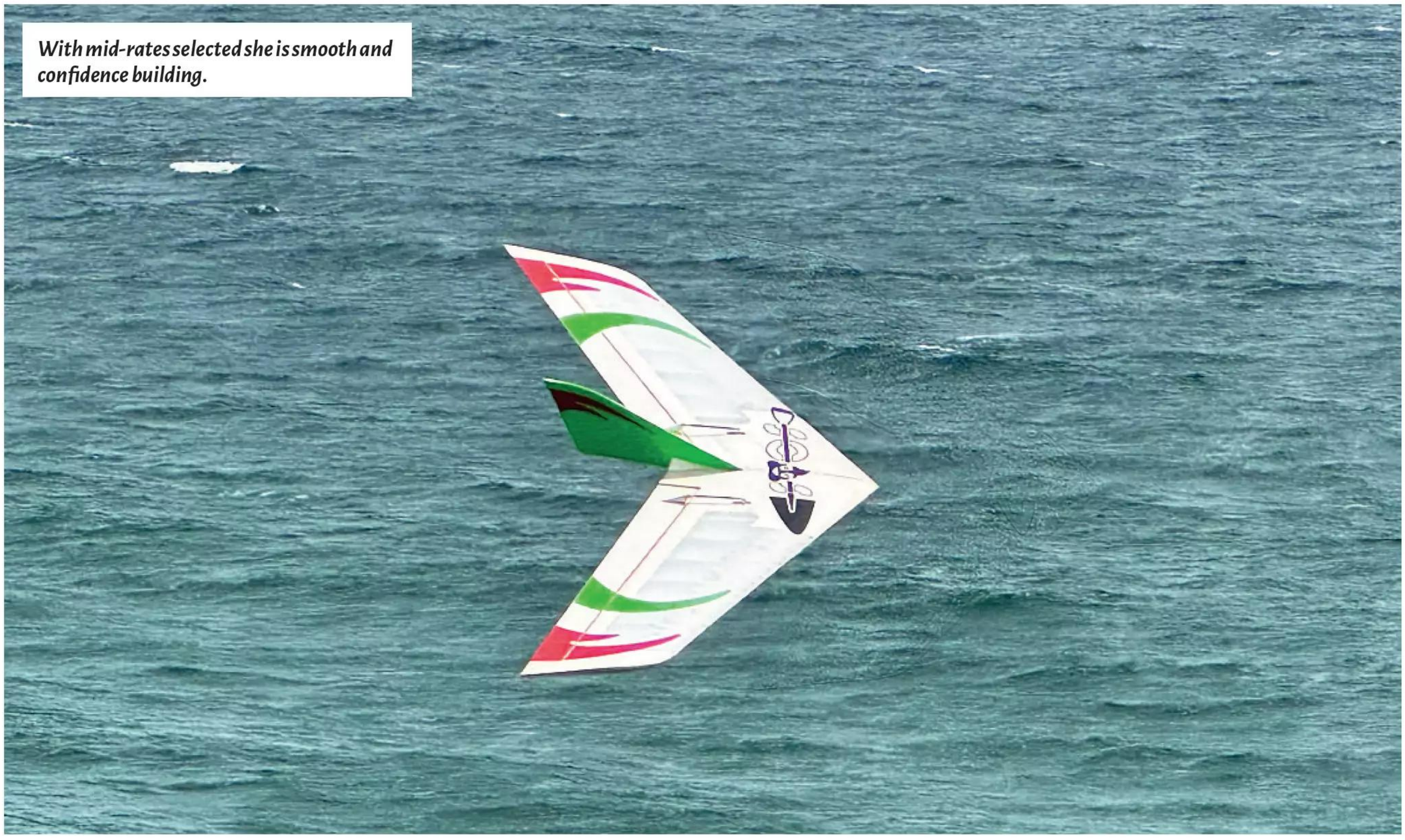
As with most cliff-based soaring sites the landing terrain was a little rugged and not exactly conducive to a smooth landing.



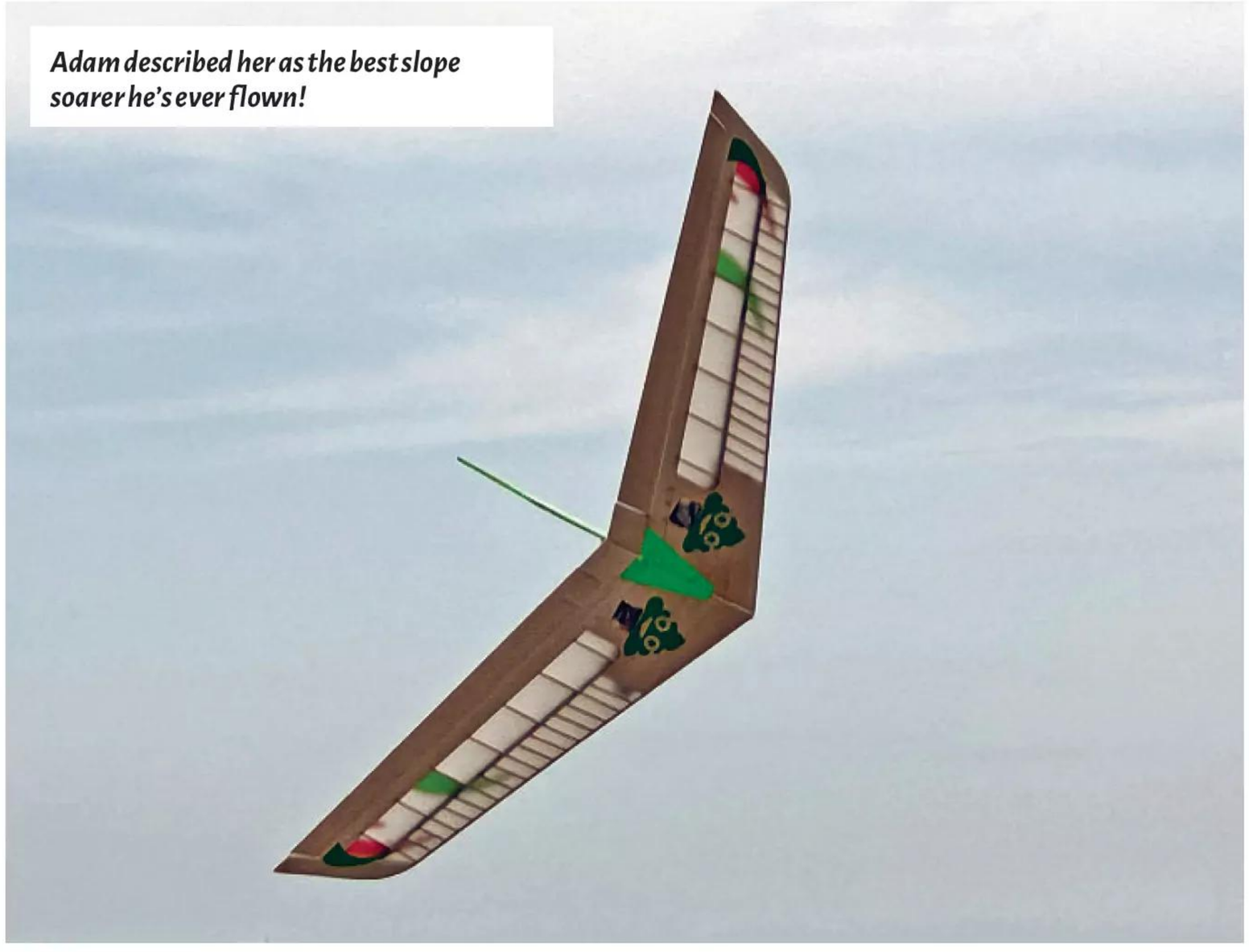
Plugging in the wiring is a bit fiddly so assembly is best done in the back of the car out of the wind. Embedded magnets pull it all together.



Fully covered and decals applied.



With mid-rates selected she is smooth and confidence building.



Adam described her as the best slope soarer he's ever flown!

Helpfully, the design of the model is such that the magnet fasteners pop apart to absorb excess energy on landing and so the model came away from one of my bumpy landings completely unscathed. I'm not sure you'd call it a feature, but it was certainly very helpful indeed!

THIRD FLIGHT

Having gained total confidence in the SOAS, Adam decided to really wring her out. She climbed away vertically from a gentle release into a 10-knot breeze and fair ate up the sky, wheeling and turning smoothly. As with all slope soarers it was necessary to keep the speed up but when suitably trimmed the performance was incredible. She flew really well inverted, maintaining speed and manoeuvrability and Adam described her as the best slope soarer he's ever flown, a mini slope pattern ship with pretty much everything in her repertoire: loops, bunts, rolls, wingovers, Split S, Derry Turns, inverted flight and even a passable Rolling Circle.

"As with most cliff-based soaring sites the landing terrain was a little rugged"

When the time came to land, she slowed down beautifully on the leeward side of the slope for a gentle controlled landing.

SUMMARY

What a winner! This model punches well above her weight, being a really capable slope soarer with astonishing performance for her size and weight. Plus, she's sufficiently small to fit into a small wing bag and to be carried halfway around the world.

Having left the original in Oz for Adam, I'll be building another for myself upon my return to the UK. ■

DATAFILE

Model:	SOAS v3
Model type:	Flying wing slope soarer
Manufacturer:	Angelwing Designs https://www.angelwingdesigns.co.uk
RRP:	£72.99
Wingspan:	900 mm (35.4")
Wing area:	17.5 dm2 (271 in2)
Weight:	180 - 200 g (6.5 - 7.75 oz)
Wing loading:	10.3 – 12.6 g / dm2 (3.5 - 4 oz / sq.ft.)
Functions (servos):	Ailerons, elevator

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Going Places

Diary dates for the coming season

If you are planning an aeromodelling event over the next few months, then please send details - **up to 100 words maximum** - to Beth Ashby at: **Beth.Ashby@artichokehq.com**.
If you intend to visit any events listed, then please check with the organisers before travelling in case of any last-minute changes.

MARCH

Mar 20

Waltham Chase Aeromodellers Small Models Meeting at Wickham Community Centre, Mill Lane, Wickham, Hants, PO17 5AL. From 7pm till 9.30pm. Hall is suitable for smaller indoor R/C models. Models to be limited to a max. weight of 95g for fixed wing inc. battery (max. 2S LiPo), helicopters limited to 305mm (12") rotor dia. Models will be weighed and judged on their suitability for the venue. Flying will be in accordance with our indoor flying guidelines on our website. Admission £6 for fliers, £2 for spectators and junior fliers. Accompanied junior spectators and parents of junior fliers admitted free. Fliers to show proof of insurance. For further details please contact Alan Wallington on 01489 895157, email indoor@wcaero.bmfa.club or visit https://wcaero.bmfa.club

Mar 23

White Sheet RFC Open Slope for Vintage Scale, Modern Scale soarers, F3f and F5j competition models or 'Anything In Between' such as PSS gliders. The scheduled Sundays are preferred but as always Saturdays are an option. The Open Slopes Secretary will analyse the forecast and attempt to choose the most suitable day. The decision is usually made on the Friday before the event, occasionally earlier if conditions are more settled. Please check with the WSRFC before travelling: https://whitesheet.bmfa.club.

Mar 23

Southern Counties Spring Swapmeet, Mountbatten School, Romsey, Hampshire, SO51 5SY. One of the largest swapmeets in southern England with over 50 tables. Sellers with a booking admitted from 8:00 am. Buyers from 8:30 am onwards. Noon finish. Admission only £4, under 16s free. First table costs £10 (including one admission), additional tables cost £6 each. Refreshments will be available. To pre-book tables only call Mike Stokes on 07702 742647. More details at hmfa.bmfa.org

Mar 30

Leafields Spring Swapmeet at Wharf Road, Pinxton, Derbyshire, NG16 6NY. The most popular swapmeet in the area with a well-established trading record of consistent numbers of traders and attendees. Doors will be open to the public at 10:00 am and traders are welcome from 8:45 am onwards. Admission is £2.00 pp at the door for adults with under 15s free entrance. Hot and cold refreshments will be available throughout the course of the morning. Tables are available at £5.00 each and are selling very well so if you wish to wish to book a table, please ring Dave Moore on 07793 815654 or email at gyrservices@w3z.co.uk.

APRIL

April 3

Waltham Chase Aeromodellers Small Models Meeting at Wickham Community Centre, Mill Lane, Wickham, Hants, PO17 5AL. From 7pm till 9.30pm. Hall is suitable for smaller indoor R/C models. Models to be limited to a max. weight of 95g for fixed wing inc. battery (max. 2S LiPo), helicopters limited to 305mm (12") rotor dia. Models will be weighed and judged on their suitability for the venue. Flying will be in accordance with our indoor flying guidelines on our website. Admission £6 for fliers, £2 for spectators and junior fliers. Accompanied junior spectators and parents of junior fliers admitted free. Fliers to show proof of insurance. For further details please contact Alan Wallington on 01489 895157, email indoor@wcaero.bmfa.club or visit https://wcaero.bmfa.club

April 5

Delyn Model Flying Club Swapmeet at Halkyn Parish Hall and library, CH8 8ES. What 3 words shrub.poems.continued.off. A55 junction, 32b. Open for sellers from 8:30am and buyers from 9:30am. Unlimited parking tea and coffee available. Lots of model flying goodies on offer, come and fill your boots. For booking ring Bill Lowes on 07811 159891 or darcyrabbit@aol.com.

Apr 6

White Sheet RFC Scale Event. Scale Days could be either Saturday or Sunday, with the preferred day always being a Sunday. After analysing the forecasted conditions, the Scale Secretary will make the final on/off call on. Please note the reserve date of the 27th. Please check with the WSRFC before travelling: https://whitesheet.bmfa.club

Apr 12

CADMAC Swapmeet at Stannington Village Hall, Stannington, Northumberland NE61 6EL. The Village Hall is at the back of the Ridley Arms Pub car park. The event is open to all, but aeromodelling items only. Sellers fee £6 per table plus the entrance fee, all tables are provided. Admission £2, Ladies and under 16s free. Sellers set up at 12:00pm. Buyers enter at 12:30pm. Doors close at 3:00pm. All proceeds go to Northumbrian Air Ambulance. Please co ntact Bob Brown on rwbrown17@gmail.com or 07515 682543 to book a table.

Apr 12

Tonbridge Gassers and Rubber Fanciers Indoor Flying at Kings Sport Centre, 601 Maidstone Road, Rochester, ME1 3QJ. From 6:30 pm until 10:00 pm. Free flight, Lightweight R/C and 3D R/C timed flying sessions throughout the evening. Contact Steve on 0208 942 5000 or Eric on 07763 398 416.

Apr 12-13

The Great Cornish Model Show at Pool Academy, Church Road, Pool, TR15 3PZ. A celebration of modelmaking talent in Cornwall! Featuring around 15 working model train layouts, R/C and miniature model aircraft, model boats and ships, R/C trucks and cars, military modelling, model engineers, miniature figure painting, paper modelling, plastic kit modelling, wargamers, miniature room sets and dolls houses, modelling demonstrations. Full trade support. Open on Saturday from 10:00am –5:00pm and Sunday 10:00am –4:00pm. Tickets: Adults £8.00, under 16s £5.00, Family £15.00, under 5s free. Free parking, easy access, hot food and refreshments all day. For more information, please visit www.hfmrc.uk

Apr 12-13

PSSA 'Fly for Fun' event at The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for pilots brief 10am each day. Proof of BMFA (or equivalent) Insurance and Pilot Competency certificate required. All models to be fitted with compliant CAA OpID number. Note due to slope access restrictions in place during Spring this event WILL NOT RUN as listed if the prevailing winds are Easterly and we would need to fly over the pier. In this case a decision will be taken in the week running up to the event and we will look to defer the date as best we can. For more information contact Phil Cooke on 07772 224719, email webmaster@pssaonline.co.uk or go to // www.pssaonline.co.uk/about-us/events/

Apr 13

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Apr 15

PMAC Swapmeet At Chelford Village Hall, Knutsford Rd, Chelford, Macclesfield SK11 9AS. Please note this venue is a replacement for this well-established Swapmeet (ex Deanwater). From 7pm to 9pm, doors open for table holders at 6:30pm. Tables £10 each (includes entry for one person). Entry £3 per person. Tables limited to 30 only, table booking required. Vehicles greater than 2.1m tall will need to be advised to the organiser (use contact below) due to parking restrictions. Table bookings required by contacting Tim Cheal. email: tim.cheal@btinternet.com

Apr 16

Waltham Chase Aeromodellers Medium Hall Indoor R/C Meetings at Crofton Community Centre, Stubbington Lane, Stubbington, Hants PO14 2PP. From 6.30pm to 9pm. The sports hall is four-badminton court size and particularly suitable for lightweight indoor R/C models. Flying at these events will take place in accordance with our indoor flying guidelines (available on our website). Admission £8 for fliers and £2 for spectators and junior fliers, whilst accompanied junior spectators and parents of junior fliers admitted free. Fliers will be required to show proof of insurance. These events are supported by the BMFA Southern Area. For further details please contact Alan Wallington on 01489 895157, email indoor@wcaero.bmfa.club or visit https://wcaero.bmfa.club

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Apr 18

Watton Radio Model Club Bring & Buy at Hingham Sport/Social Club, Watton Road, Hingham, NR9 4HB. Sellers from 5.30 pm. £5 per table additional helpers £1. Doors open 6 pm, entry £1. Bar open. Contact Martin Pawsey on 01953 883892 or email: martin.pawsey@btinternet.com or visit www.wrmc.uk

Apr 26-27

Scale Indoor RC Nationals and Scale Indoor FF Nationals at Walsall Campus Sports Hall the University of Wolverhampton, Magdalene Road, Walsall WS1 3TA. Competitors can enter both days by completing the electronic entry form found on the BMFA Scale Technical Committee Website at: https://scale.bmfa.org. Spectators are welcome to view proceedings from the seated gallery area overlooking the sports hall. The fee for spectators is a bargain £5.00, allowing entry for both days (free for accompanied under16s). There is ample free car parking for visitors onsite at the University. Why not come along and take part or be simply inspired by viewing the best in UK and European Scale Indoor aeromodelling. For further details please contact enquiriesbmfascale@yahoo.com

MAY

May 3-4

Festival of Fun Fly at BMFA Buckminster. Two days of informal competitions and practice for all of the BFFA Classes, including the Foamy Class. This is an ideal event for first timers to come and have a go and for the more experienced to shake some dust off. As this event will be held at BMFA Buckminster with camping available via manny@bmfa.org . Rules and general info at www.funfly.bmfa.org or via the Fun Fly Group Facebook page. Note that this has to be electric power only due to bank holiday restrictions. If you would like to come along, please contact James Gordon, jamesrrg@hotmail.com or tel 07966 439835.

May 8

White Sheet RFC BMFA F3f League. Please note the reserve date of 8th June. Please check with the WSRFC before travelling: https://whitesheet.bmfa.club.

May 11

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May 17

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JUNE

June 1

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June 12

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June 28 – July 6

PSSA 'Fly for Fun' event with the Lleyn MAC – Nr Abersoch, North Wales. Meet at the Londis car park in Llanbedrog for 09:30am each day. Slope map will be left in shop window for late arrivals (weekends only). Proof of BMFA (or equivalent) Insurance and Pilot Competency certificate required. All models to be fitted with compliant CAA OpID number. For more information contact Phil Cooke on 07772 224719, email webmaster@pssaonline.co.uk or go to //www.pssaonline.co.uk/about-us/events/

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O.S. FS70 Surpass - £75, O.S.40 Surpass - £50, O.S.40 4 stroke, earlier one - £40, O.S. Max 40 R/C - £25, JBA 61A ABC (Chinese) - £40, Frog 80 - £15, Flexible exhaust extension for FS40 and FS61, brand new unused - £5, Pair of Williams 5W diameter (5th scale) vintage wheels - £25 brand new, unused. Call Ian on 01460 394579 (Somerset).

FREE PLANES & radios. Funboy, Tiger Moth, 4-channel, Easy Star, Spectrum, DXGi transmitter. Loads of spares, inc. servos etc. Selling due to having a clear out. Contribution to Alzheimer's society required. Buyer to collect. 01789 721225 (Stratford on Avon).

FLAIR BRISTOL FLIGHTER KIT NIB - £250. Buyer to collect. 01525 370205 (Bedfordshire).

4 x 6-CHANNEL and 1-channel Hi-Tec Optima receivers – offers? Email sandytough@btinternet.com (Aberdeen).

SLEC HIGH TECH PROPELLER BALANCER x 2. One is complete, the other is missing a spindle - £20 par inc. P&P. Hawker Hind plan 37", Bristol Scout Hansa D1 49" - £12 each inc. P&P. Call John on 01407 710312 (N.W. Wales)

D.B SPORT & SCALE MASCOT 1500 mm (59") span trainer, untouched kit - £120 ono. Buyer to collect. 01509 508821 (Loughborough).

DB MODELS SOPWITH PUP E, 1/8 scale, 40" span inc. Vickers gun, cockpit dashboard, 3D wheels, pilot, ESC & motor. Covered in olive drab and only flown twice - £250. Buyer to collect. 01952770818 (Telford).

SOPWITH PUP PLANS David Boddington 63.5", stained but unused. Dennis Bryant SE5a (copies). Bryan Taylor Hawker Hurricane (copies). Tony Nijhuis Mk 9 Spitfire 62.5" - £15 each inc. P&P. Call John on 01407 710312 (N.W. Wales).

SARIK HOBBIES HAWKER HUNTER FCA9, 48" span, 62" length, 4 lbs weight from laser cut balsa. Building manual and two sheet plan. Uses 6S LiPo and 90 mm EDF, lovely kit - £75 + P&P of £5.90. 07946 414532 (W.Yorks).

UNTOUCHED CARL GOLDBERG KITS, anniversary edition Piper Cub, 76" wingspan - £120. Electra powered glider, 78" wingspan, motor, prop and spinner included in kit - £60. Buyer to collect. 01789 293209 (Stratford-on-Avon).

KEIL KRAFT GAUCHO powered glider, 44" wingspan - £40. Contest Kits Empress, 72" wingspan - £45. Buyer to collect. 01789 293209 (Stratford-on-Avon).

JUNKERS F13 ARTF KIT, 48" wingspan, electric, no Rx - £90. USKY 40 ARTF kit, American trainer colours - £45. Great Planes Nieuport XI, 36" wingspan, electric - £90. SC40 new and boxed - £30. Call Richard on 01793 694675. (Wilts).

TIGER MOTH DH85A from Premier Balsa products. Deluxe kit, 66" wingspan - £120. Guillows Spitfire, 27" wingspan. R/C, C/L or rubber - £35. Buyer to collect. 01789 293209 (Stratford-on-Avon).

WANTED

D.B. BARNSTORMER 50" bi-plane plan. Will pay full price. Call Tom on 01443 670462 (Cardiff).

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ALL UNMADE plastic aircraft kits; Frog, Airfix, Revell etc. Also aviation and military books, diecast aircraft etc. Please call 07973 885754 (Kent).

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Next issue

FUNDROID

Fun fly models are typically high wing monoplanes with minimal structures, large wing areas and thick aerofoil sections. Competition flying involves manoeuvring close to the ground, passing through limbo gates and fast landings. The airframe is likely to take some knocks and some people might be put off risking a model in Fun Fly. To address this Mike Bell decided to investigate whether he could reduce the cost of building a fun fly machine and make pushing the flight envelope less of a financial risk. In the last few years Mike has been experimenting with alternative materials, including Foamboard and Depron, but can they stand up to the rough and tumble of competition or enthusiastic sport flying? Fundroid has proven to be just as strong as any wooden fun fly Mike has ever built with the same weight. Fundroid's credentials were tested at last year's Fun Fly Nationals where Mike managed third place in Class 3 and took a win in Class 3 touch and goes.

ELRS EXPLAINED

If you are looking to buy a new transmitter from the likes of Radiomaster, Jumper or FlySky then one of the options that you will come across is Express LRS - or ELRS for short. These radios also come with a graphical interface that uses EdgeTx (previously called OpenTx), but the two are separate; a transmitter can use EdgeTx but not use the ELRS protocol, for example.

In an informative article in the next issue Kevin Scott provides an overview of what Express LRS is, along with its benefits and quirks, so that you can be fully informed before buying an ELRS system.

JERSEY JERK

It was approaching the end of summer 2023 when Kevin Powling's thoughts started to turn towards a project that would keep him busy throughout the coming winter. Kevin already had a couple of Spitfires and two CARF P-47s. What he didn't have was a Mustang.

After looking at many pictures of Mustangs he kept coming back to one he was particularly keen on, Jersey Jerk flown by Don Strait of the 361 Fighter Squadron. Kevin already had experience of CARF kits and their P-51 met the size criteria he was looking for. The kit was ordered from Motors & Rotors and arrived by mid-October, just in time for winter.

RCM&E
MAY 2025
Issue on sale 18th April

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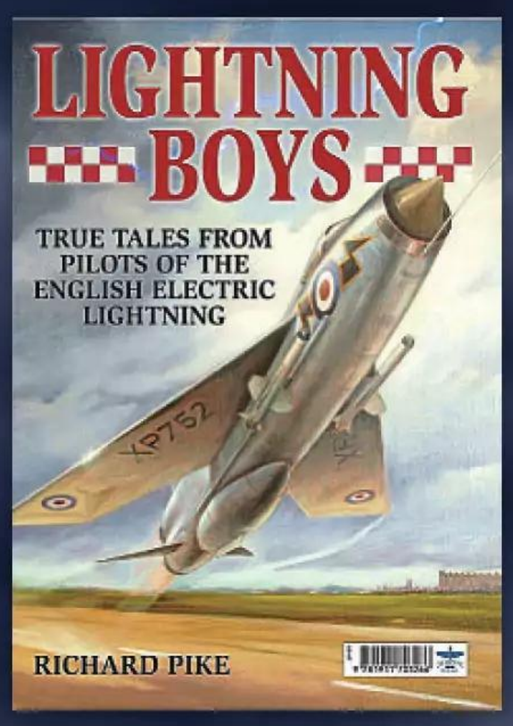

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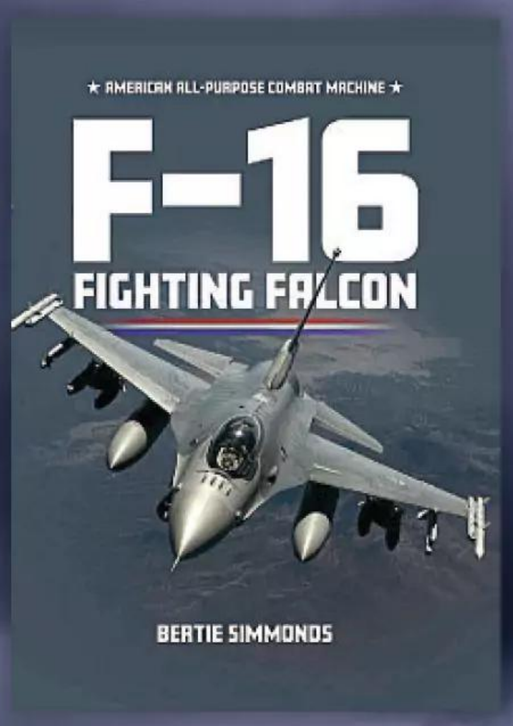

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PARTING SHOT

DATAFILE

Photo:	Barry Cole
Camera:	Canon EOS 70D
Aperture:	f/5.6
Focal Length:	70 mm
Shutter Speed:	1/1000 sec
Lens:	EF70-300 mm f/4-5.6 IS USM
ISO:	100
Metering:	Action program

PENSIONER'S PAL

Tired of launching all those 7 kg plus scale gliders? The 1/6th scale Slingsby Kite is the Pensioner's Pal, leaving you comfortably seated while you get your flying fix...

Photo by Barrington V. Smallpiece (a.k.a. Barry Cole)

Chris Williams (when he is not caught lounging in a chair!) is the builder and designer of the 2.5 metre span Slingsby Type 23 Kite, pull-out plans for which were offered in RCM&E's August and September 2024 issues.

Pilot

PUSHING THE LIMITS

NEW 67" EDGE 540 V3

The EDGE-540 V3 67" is a game changer, outstanding in a variety of flying styles

Wingspan: 67.5in (1.714m)
Length: 68in (1.745m) with spinner
Wing area: 956sq in (6,170sq cm)
Weight: 8.1lbs (3.7kg)
Motor: 20cc or Electric Equivalent

RRP: **£489.95**

PIL824 - Red/White/Black (Scheme 01)

PIL825 - Yellow/Blue/White (Scheme 02)

*Photos shown are for colour scheme purposes only, actual kit may vary

Recommended Power Pack (Not Supplied):
Pilot-RC 67in Power Pack with MacGregor MG5921HV Servos - **RRP: £399.95**

NEW 90" EXTRA 330SX

If your looking for a big airframe feel in a 70cc then look no further than the Pilot-RC Extra 330SX

PIL800 - Red/Silver/Black (Scheme 01)

PIL801 - Blue/Orange/White (Scheme 02)

PIL810 - Blue/White (Scheme 03)

Wingspan: 90in (2.29m)
Length: 83.2in (2.15m)
Wing area: 1,506sq in (9,720sq cm)
Weight: 9.04kg (19.9lbs)
Motor: 50-70cc or equivalent electric

RRP: **£989.95**

POPULAR PILOT-RC KITS

EXTRA NG

Red/Blue/Silver - (Scheme 07)

PIL827
Wingspan: 60in (1.52m)
RRP: **£399.95**

Blue/Orange - (Scheme 05)

PIL745
Wingspan: 67in (1.7m)
RRP: **£489.95**

Red/Blue/Silver - (Scheme 07)

PIL832
Wingspan: 67in (1.7m)
RRP: **£489.95**

LASER

Green - (Scheme 07)

Wingspan: 67in (1.7m)
RRP: **£479.95**

Orange - (Scheme 08)

PIL694
Wingspan: 67in (1.7m)
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SLICK

Blue/Green - (Scheme 02)

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X1300

NEW!

X1300 is a high wing monoplane with 1300mm wingspan and a rear-mounted pusher propeller, delivering FPV flying experience with stability and forward visibility. Hand launch is a breeze while taking off from the ground with landing gears (sold separately) is also an option.

XFly Model X1300 is an FPV aircraft which uses 3D printing technology on most components. 3D files are accessible for customers to download and print plastic parts for replacement or modification, making it possible to explore more fun.

FEATURES:

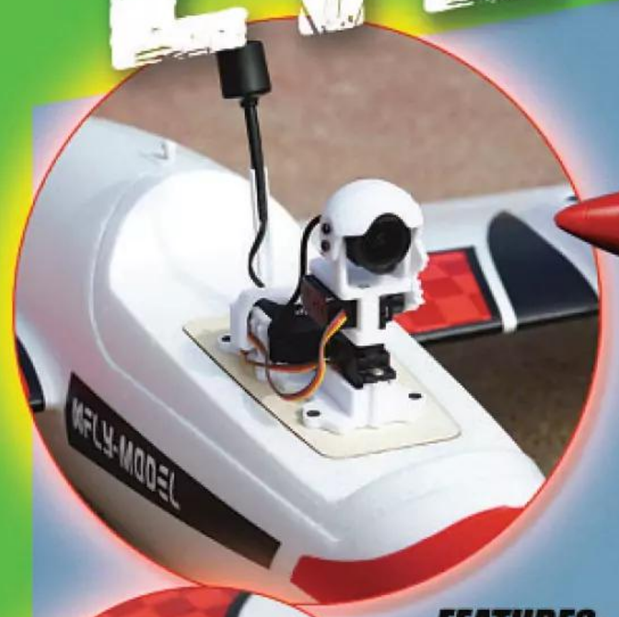
- Quick assembly with no screws or glue required
- Spacious battery compartment allowing for 4S LiPo batteries or 21700 batteries for optimized flight times
- 3D files accessible to download, making it easy to acquire plastic parts needed
- Digital metal gear servos with ball-link equipped linkages for precise and stable movement
- Easy to hand launch, or install the optional landing gears to take off from the ground
- Flaps can be added in the reserved position

Part No: XFW003P XFLY X1300 FPV MONOPLANE PNP WITHOUT TX/RX/BATTERY **£169.99 RRP**

IN ACTION! SEE IT

EYES IN THE SKYS

X2100



FEATURES:

- The layout design of the glider has natural advantages in flight time and flight stability.
- Twin power systems and the large wingspan design providing ample space for future payload additions
- Capacious battery compartment allowing for common 4S LiPo batteries or 21700 batteries for optimized flight times
- All components can be assembled without glue and fixed with screws, featuring a safe and reliable design
- A gimbal installation position is reserved on the nose section of the aircraft for a standard two-axis gimbal, or it can be modified by yourself

IN ACTION! SEE IT

Derived from XFly Swift 2100 glider, X2100 is an FPV carrier aircraft designed by XFly Model team specially for FPV hobbyists.

The X2100 adopts a glider layout design with a high aspect ratio, which has natural advantages in flight time and flight stability. Twin power systems allow it to easily achieve 1:1 thrust-to-weight ratio, and the large wingspan design of the aircraft provides ample space for future payload additions. Capacious battery compartment allows for common 4s Lipo batteries or 21700 batteries for optimized flight times.

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CARD & FOAM CUT AWAY TO CREATE A SLOPE TO MATCH FUZ TOP NOSE SHEET

PART A

SECTION

PART B

SLOT FOR VELCRO STRAP

BATTERY FLOOR DETAIL
(AS VIEWED FROM INSIDE THE FUZ)

PART A IS GLUED IN BEHIND BOTTOM SHEETS AND PART B GLUED ON TOP (TOP OF PART B SHOULD BE FLUSH WITH BOTTOM SKINS OVER THE SPAR AND BE SLIGHTLY PROUD AT L.E. DUE TO SECTION UPSWEEP)

WING FIXING LUGS
(2 REQUIRED)

NOSE OF WING REMOVED AFTER THE WINGS ARE JOINED AND A FLAT SANDED INTO THE TOP SKIN TO MATCH THE FUZ TOP SHEETING

R1

THIS SECTION OF BOTTOM SKIN IS REMOVED AFTER THE

CARD REMOVED FROM WING

PLA

PLEASE VISIT WWW.SARIKH

PLEASE NOTE, THIS PLAN
NO PART OF THIS PLAN MY BE REPRO
ELECTRONIC OR MECHANICAL, INCLUDING
RETRIEVAL SYSTEM WITHOUT PR

ST8US

BY MIKE FREEMAN

AN No: RC2271	No. OF SHEETS: 1 OF 2	First published in RCM&E April 2025

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DURING THE FOLDING PROCESS
L.E. SWEEPS UP SLIGHTLY CR
SEMI-SYMMETRICAL SEC

CUT TO THIS LINE IF
6mm FOAMBOARD USED

TOP
FRO

CARD SUPPORT TABS GLUED
INSIDE TOP SKIN PRIOR TO
EDF INTAKE SCOOP BEING
GLUED IN PLACE

TUNNEL IN TOP SKIN
FOR ELEVON PUSHROD
(DISTANCE 'A' TO SUIT
SERVOS USED)

A

SLOT IN TOP SKIN FOR FIN
(OPEN OUT TO FULL WIDTH WHEN
WING IS FOLDED UP & RELATIVE POSI
OF R2 & R2A ARE KNOWN)

FIN SLOT SIDE WALL LINERS
2 OFF PER SLOT HANDED SO GLUE
SIDE STICKS TO R2 & R2A
(TRIM TO TOP SKIN AFTER GLUED IN PLACE)

FOAMBOARD

SERVO FRAME FROM FOAMBOARD
(USE THE PIECES CUT OUT FOR THE
SERVO ACCESS)

OPENING TO
SUIT SERVO

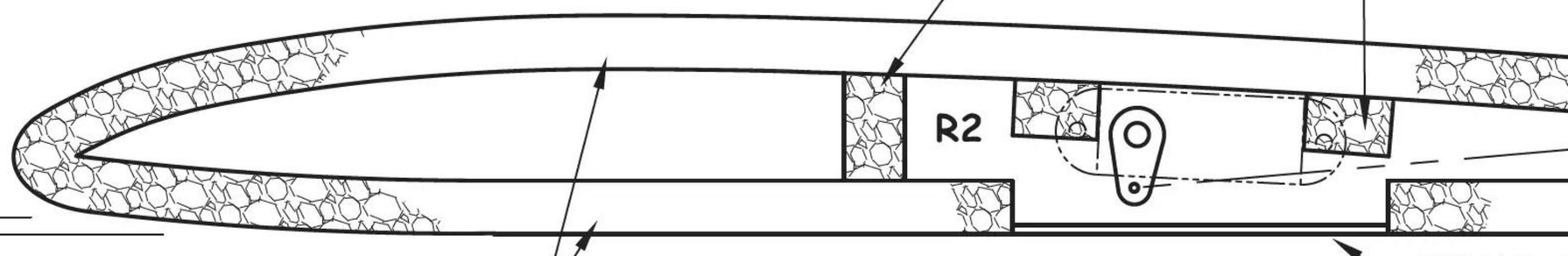
CUT SLOTS FOR SERVO LUGS
AFTER FRAME IS GLUED IN PLACE
(HOT GLUE SERVO IN PLACE)

ELEVON THR

CARD REMOVED FROM
INSIDE OF TOP SKIN
FROM L.E. TO HINGE LINE

16 12

ING THE FOLDING PROCESS THE WING
E. SWEEPS UP SLIGHTLY CREATING A
SEMI-SYMMETRICAL SECTION



TOP & BOTTOM WING SKINS FOLDED UP
FROM A SINGLE PIECE OF FOAMBOARD

FINISHED WING SECTION AT ELEVON CONT

IF
USED

APPROX LOCATION OF
ELEVON HORN (FINAL POSITION
DETERMINED WHEN PUSHROD
OPENING FORMED)

CHAMFERS SHOW
THE LEFT WING RIB

CARD/FOAM/CARD

A

OT IN TOP SKIN FOR FIN
UT TO FULL WIDTH WHEN THE
OLDED UP & RELATIVE POSITIONS
F R2 & R2A ARE KNOWN)

HINGE LINE

ELE

FOAMBOARD

ELEVON THROW GAUGE

AILERON : 10mm UP/12mm DOWN
ELEVATOR 4mm UP/5mm DOWN

OVED FROM
TOP SKIN
HINGE LINE

8 4

SCALE
INCHES

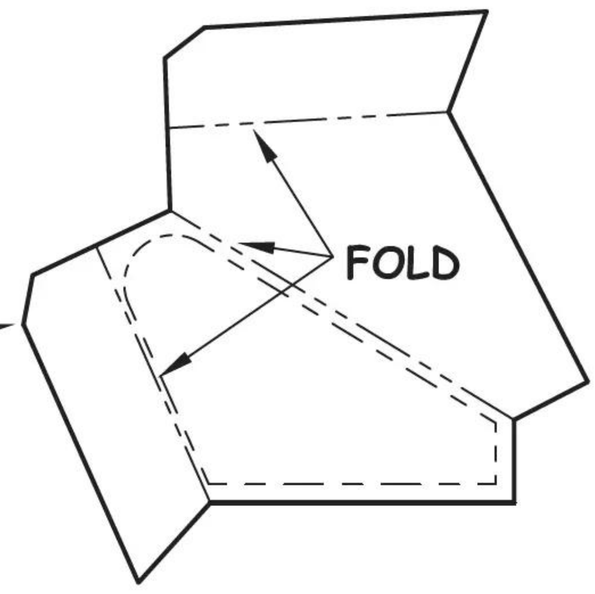
RD
ME

TUNNEL IN TOP SKIN FOR
ELEVON PUSHROD

ELEVON HORN MADE UP FROM
5 PIECES OF CARD GLUED
TOGETHER AND WRAPPED
IN BROWN PAPER

COVER FROM 3 PIECES
RD GLUED TOGETHER

SEAL HINGE GAP
WITH FILM STRIP



BROWN PAPER TEMPLATE
FOR ELEVON HORN WRAPPER

TROL HORN LOCATION

WN FOR RIGHT WING
BS SHOULD BE OPOSITE

HOLE FOR SERVO LEAD

R1 (L.E.)

R1 (T.E.)

R2 (L.E.)

R2 (T.E.)

R2A

R3 (L.E.)

R3 (T.E.)

R4 (L.E.)

R4 (T.E.)

VON

ROUND OFF T.E. AND
SEAL EXPOSED FOAM
WITH BROWN PAPER

BROWN PAPER GLUED
AROUND TE & TIP

TO FORM HINGE CUT
THROUGH THE FOAM ON
THE INSIDE BUT NOT
THE CARD ON THE OUTSIDE
(THE OUTER CARD FORMS THE HINGE)

4

8

THIS SECTION OF BOTTOM SKIN IS REMOVED AFTER THE WINGS ARE JOINED TO ALLOW BATTERY FLOOR TO BE GLUED IN

R1

CARD REMOVED FROM WING TIP SIDE OF ALL RIBS AND BOTH SIDES OF R2A

FOAMBOARD DIHEDRAL BRACES 2 REQUIRED

SLOT FOR WING FIXING LUGS (WIDTH TO SUIT FOAMBOARD USED)

SCRAP FOAM BETWEEN SKINS

WING SPAR

FOLDED CARDS (FULL HEIGHT OF SPAR)

FOAMBOARD DIHEDRAL BRACES

DIHEDRAL BRACE DETAIL

SAND TAPER TO RECEIVE TOP SKIN

CHAMFER ROOT OF SPAR TO SUIT WING TAPER

WING MAIN SPAR

SCALE MM

100

200

OPENING TO SUIT SERVO

CUT SLOTS FOR SERVO LUGS AFTER FRAME IS GLUED IN PLACE (HOT GLUE SERVO IN PLACE)

ELEVON THR

CARD REMOVED FROM INSIDE OF TOP SKIN FROM L.E. TO HINGE LINE

CG RANGE AT

R2

R3

VO ACCESS
G IN BOTTOM
SKIN

R2A

SPACING BETWEEN R2 & R2a TO SUIT THICKNESS OF FOAMBOARD USED

INSIDE
FROM ARE

THIS LINE IF
OAMBOARD USED

SLOT IN BOTTOM SKIN FOR FIN (WIDTH TO SUIT FOAMBOARD USED)

HINGE LINE

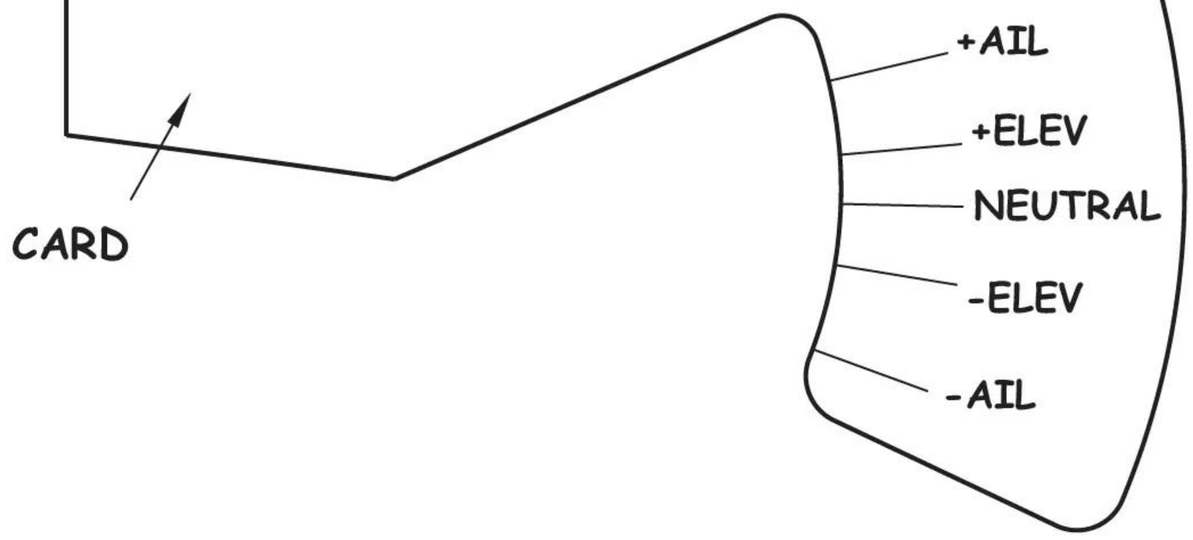
FOAM & OUTSIDE CARD ONLY

300

400

ELEVON THROW GAUGE

AILERON : 10mm UP/12mm DOWN
ELEVATOR 4mm UP/5mm DOWN



OVED FROM
TOP SKIN
HINGE LINE

CG RANGE AT WING L.E.

SWEET SPOT

CREASE LINE SHOWN DASHED
(THIS IS ALSO THE FINISHED WING L.E.)

R4

INSIDE CARD REMOVED
FROM AREAS SHOWN THUS

CARD/FOAM/CARD

HINGE LINE

TOP OF WING IS HORIZONTAL

15mm DIHEDRAL UNDER EACH
TIP (= 3 SCRAPS OF FOAMBOARD)

400

500

TO FORM HINGE CUT
THROUGH THE FOAM ON
THE INSIDE BUT NOT
THE CARD ON THE OUTSIDE
(THE OUTER CARD FORMS THE HINGE)

FOAM & OUTSIDE CARD ONLY

SAND BACK TO FINAL SHAPE
AFTER GLUED IN PLACE

WING TIP UPPERS
(WITH CARD REMOVED
FROM BOTH SIDES)

EDGE OF BOTTOM SHEET AT TIP
TO TAPER FROM 5MM AT LE TO
0MM AT HINGE LINE

EXTENT OF TIP TAPER

ALL EXPOSED FOAM AT TIP
SKINNED WITH BROWN PAPER

FOAM & OUTSIDE CARD ONLY

NOTES

1. THIS MODEL IS BUILT ENTIRELY FROM FOAMBOARD AND BROWN PAPER
2. UNLESS STATED OTHERWISE ALL REFERENCE TO 'CARD' MEANS THE CARD REMOVED FROM FOAMBOARD DURING CONSTRUCTION
3. ALL BROWN PAPER IS APPLIED WITH ALIPHATIC RESIN OR SANDABLE PVA THINNED TO 70% CONSISTANCY

TARGET FLYING WEIGHT

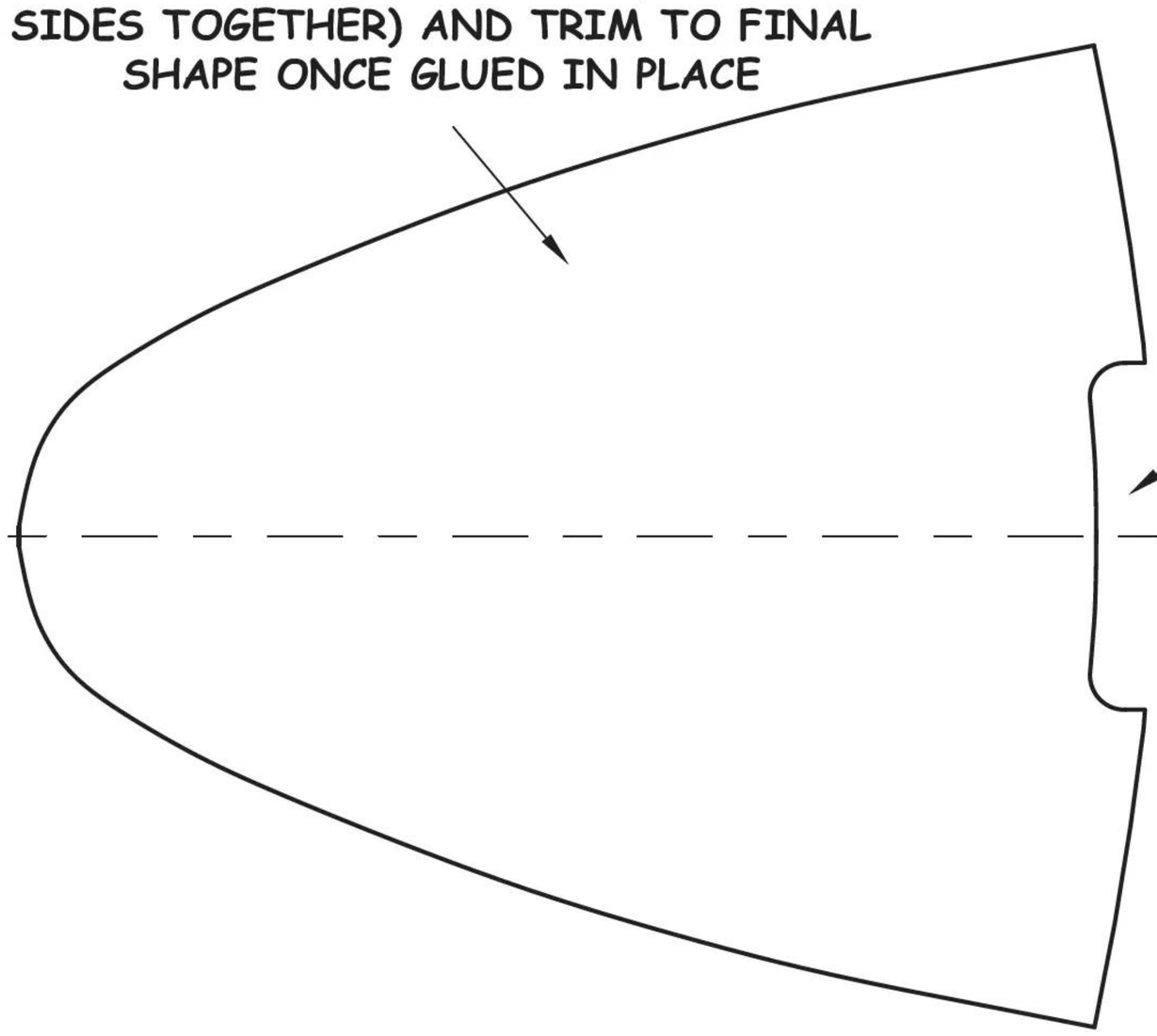
WITH 1800mAh 3S LI-PO: 615g (21.7oz)

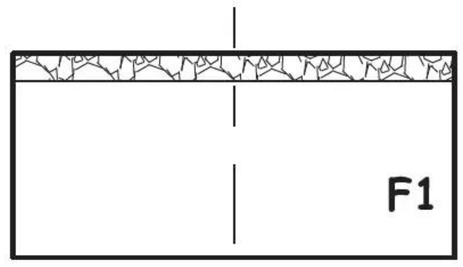
28

24

500

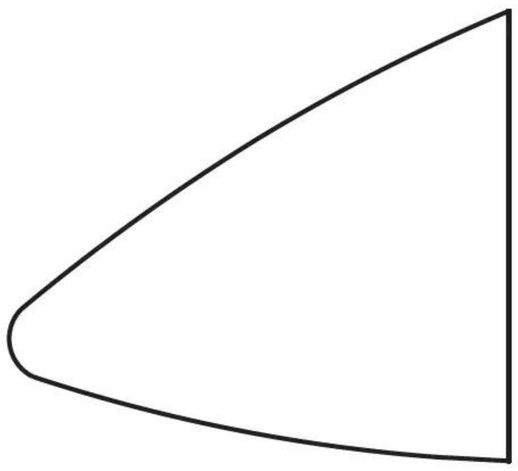
EDF INTAKE SCOOP, 2 OFF FROM CARD.
FORM SCOOP OVER MANDREL (WITH GLUE SIDES TOGETHER) AND TRIM TO FINAL SHAPE ONCE GLUED IN PLACE

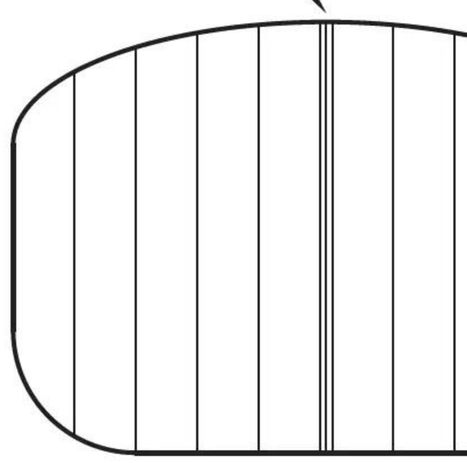




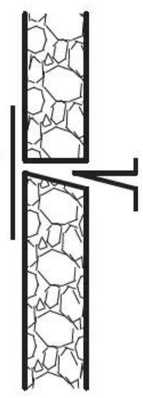
COOLING AIR OUTLET SLOT

CARD REMAINS ON INNER FACES ON CENTRE LINE ONLY

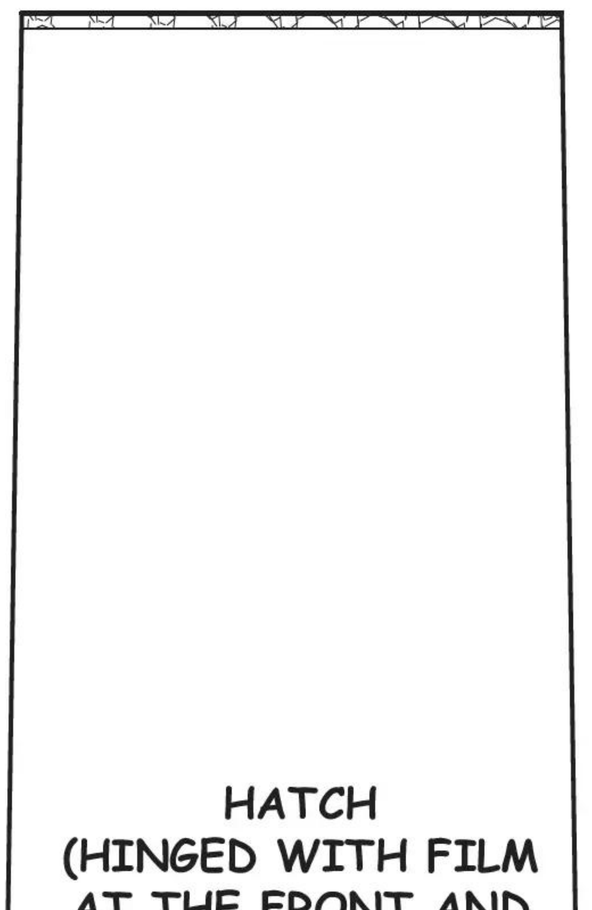




FILM HINGE TO HATCH

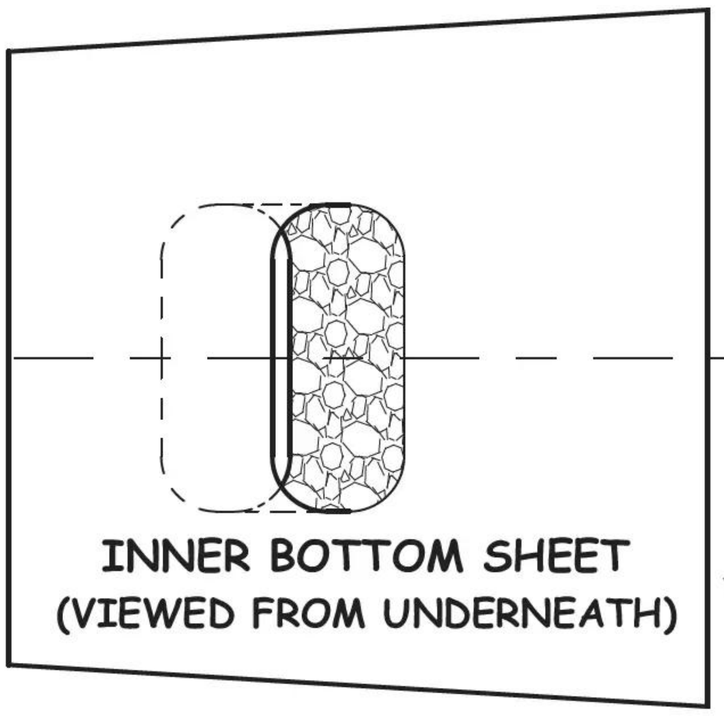


NOSEBLOCK FROM 10 OFF FOAM BLANKS
(REMOVE CARD FROM ALL EXCEPT ON CENTRELINE)



HATCH
(HINGED WITH FILM AT THE FRONT AND HELD AT THE BACK WITH MAGNETS)

SEAL ALL EXPOSED FOAM EDGES WITH BROWN PAPER



INNER BOTTOM SHEET
(VIEWED FROM UNDERNEATH)

BOTTOM NOSE SHE
PIECES OF FOAMB
REMOVED FRO

CARD REMOVED FRO

COOLING SLOT

OUTER BOTTOM SHEET
(VIEWED FROM UNDERNEATH)

300

20

16

F2

F3

F4

WING SEAT (WITH

ONLY FORMER F1 & F4 ARE GLUED IN. F2 & F3 ARE USED AS SPACERS DURING THE FUSELAGE FOLDING

TOP NOSE SHEETING FROM TWO PIECES OF FOAMBOARD WITH CARD REMOVED FROM BOTH SIDES

BROWN PAPER DOWN THE NOSE BACK TO

F2

F1

FUZ SIDES AND BOTTOM ARE FOLDED UP FROM ONE PIECE OF FOAMBOARD TO THIS OUTLINE

FINA

THE HATCH OPENIN
WHEN THE HATCH H
(SEAL EXPOSED FOAM W

EETING FROM TWO
OARD WITH CARD
M BOTH SIDES

COOLING AIR INTAKE SLOT FORMED IN BOTTOM SHEETS, LINE WITH DUCT FORMED FROM CARD

ALL EXPOSED FOAM IN NOSE AREA AND FUZ SIDES BACK TO BEHIND F2 SKINNED WITH BROWN PAPER

OM BOTH SIDES

SMAL
TO AL

CENTERLINE OF SCOOP MANDREL TO LINE

16

12

ST8US

BY MIKE FREEMAN

PLAN No: RC2271	No. OF SHEETS: 2 OF 2	First published in RCM&E April 2025

ED
FRO
FA
F
M
D

F4

WING SEAT (WITH CARD ON THE SIDE TO BE GLUED TO FUS SIDE REMOVED)

BROWN PAPER DOWN SIDES FROM
THE NOSE BACK TO THIS LINE

F2

1800mAh LI-PO
(POSITION TO SUIT CG)

F3

GAP IN WING SEAT
FOR WING FIXING LUGS

FINAL HATCH LOCATION

CREASE LINE SHOWN DASHED

THE HATCH OPENING IS CUT OUT
WHEN THE HATCH HAS BEEN MADE
(SEAL EXPOSED FOAM WITH BROWN PAPER)

CREASE LINE SHOWN DASHED

SMALL CHAMFER AT ENDS
TO ALLOW FOR CURVATURE

EDF EFFLUX NOZZLE OUTLET CORE
(ALL CARD REMOVED)

ENTERLINE OF SCOOP
MANDREL TO LINE

F SIDE CHEEKS, 2 OFF PER SIDE
M CARD, HANDED SO GLUE SIDES
ACE EACH OTHER FOR BONDING.
ORM ROUND EDF INLET SCOOP
MANDREL (CUT INNER PIECE TO
DASHED LINE TO ACCOMODATE
THE CURVATURE)

SCALE
INCHES

TOP
LEFT

TOP
RIGHT

EDF INTAKE
SCOOP LOCATION

CENTERLINE OF EDF UNIT

F4

EDF INCIDENCE STOOL FROM
TWO PIECES OF FOAMBOARD
(CARD TO REMAIN ON CENTRE LINE ONLY)

THIS SECTION HAS A TENDANCY TO CURL
UP. MAKE SURE IT IS TOTALLY FLAT BEFORE
GLUING STOOL AND EDF UNIT IN PLACE

FOAM & OUTSIDE CARD ONLY

CARD/FOAM/CARD

INSIDE CARD & FOAM ONLY

THESE LINES ARE TO HELP MARKING
OUT AND CUTTING THE FUZ BLANK

CUT INNER CARD AND
CHAMFER FOAM TO
SUIT EDF INLET

INSIDE CARD ONLY

MAKE SLIGHTLY LONGER IF
USING 6mm FOAMBOARD

THREE WRAPS OF 3mm WIDE
CARD STRIPS TO BUILD UP
THE EFFLUX OUTLET

SEAL ALL EXPOSED FOAM
EDGES WITH BROWN PAPER

OUTER BOTTOM SHEET
(VIEWED FROM UNDERNEATH)

OUTER TOP SHEETING FROM
FOAMBOARD WITH CARD REMOVED
FROM BOTH SIDES

SAND SLOPE TO
MATCH WING L.E.

INNER TOP SHEETING FROM
FOAMBOARD WITH CARD REMOVED
FROM BOTH SIDES

BROWN PAPER GLUED
AROUND EXPOSED FOAM

SAND L.E. & T.E. TO SHAPE
AND SEAL EXPOSED FOAM
WITH BROWN PAPER

SCALE
MM

100

200

SMAL
TO AL

CENTERLINE OF SCOOP MANDREL TO LINE UP WITH JOIN IN MANDREL CYLINDER

EFFLUX NOZZLE EXTERNAL SKIN FROM BROWN PAPER

DELIBERATELY WIDER AND LONGER THAN REQUIRED TO ALLOW FOR 5 & 6mm FOAMBOARD, BUILDING TOLERANCES AND FINAL TRIMMING

CARD FROM CEREAL PACKET TO SAME OUTLINE AS SCOOP MANDREL (ONLY DO THIS IF USING 5mm FOAMBOARD. IF USING 6mm LEAVE CARD OFF

ED

EDF INLET SCOOP MANDREL FROM FOAMBOARD
(WITH CARD REMOVED FROM BOTH SIDES)

THIS END OF MANDREL IS FOR THE EFFLUX NOZZLE

MUST
Ø53mm

Ø35mm HOLE

MANDREL F
FROM FOA

THIS END OF MANDREL IS FOR THE INLET SCOOP

EDF MAN

300

400

SMALL CHAMFER AT ENDS
TO ALLOW FOR CURVATURE

EDF EFFLUX NOZZLE OUTLET CORE
(ALL CARD REMOVED)

ENTERLINE OF SCOOP
MANDREL TO LINE
UP WITH JOIN IN
MANDREL CYLINDER

CARD FROM CEREAL
PACKET TO SAME
OUTLINE AS SCOOP
MANDREL (ONLY DO
THIS IF USING 5mm
OAMBOARD. IF USING
mm LEAVE CARD OFF

EDF INLET SCOOP MANDREL
GLUED ONTO MANDREL
CYLINDER

ADD EXTRA WRAPS OF CARD OR
PAPER TO MANDREL TO INCREASE
THE DIAMETER UNTIL THE JOINING
ENDS OF THE EFFLUX TUBE MEET

ANDREL FROM FOAMBOARD
OVED FROM BOTH SIDES)

EDGE
TUBE
MEET
BLA
AROU

MUST BE
Ø53mm MAX

MANDREL FORMERS
FROM FOAMBOARD

MANDREL CYLINDER AND
AND JOINING STRIP
FROM CARD SALVAGED
FROM A CEREAL PACKET

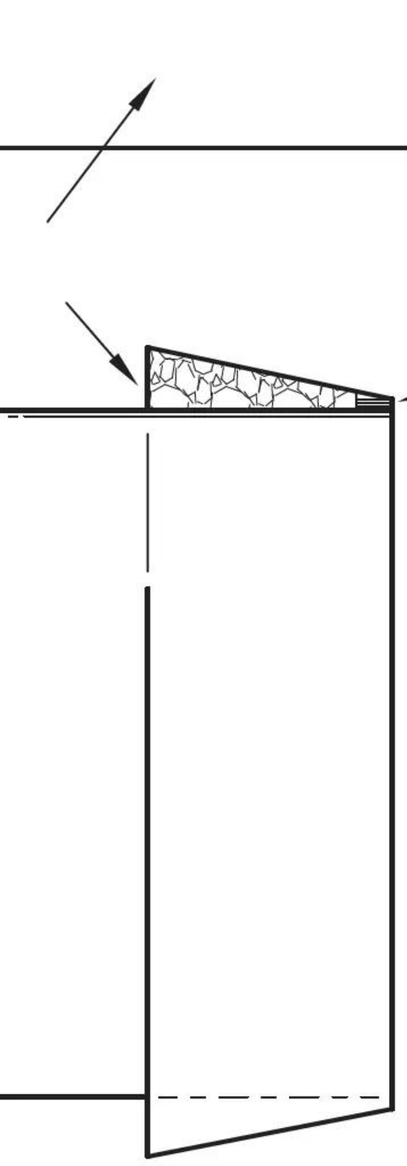
EDF MANDREL CYLINDER

400

500

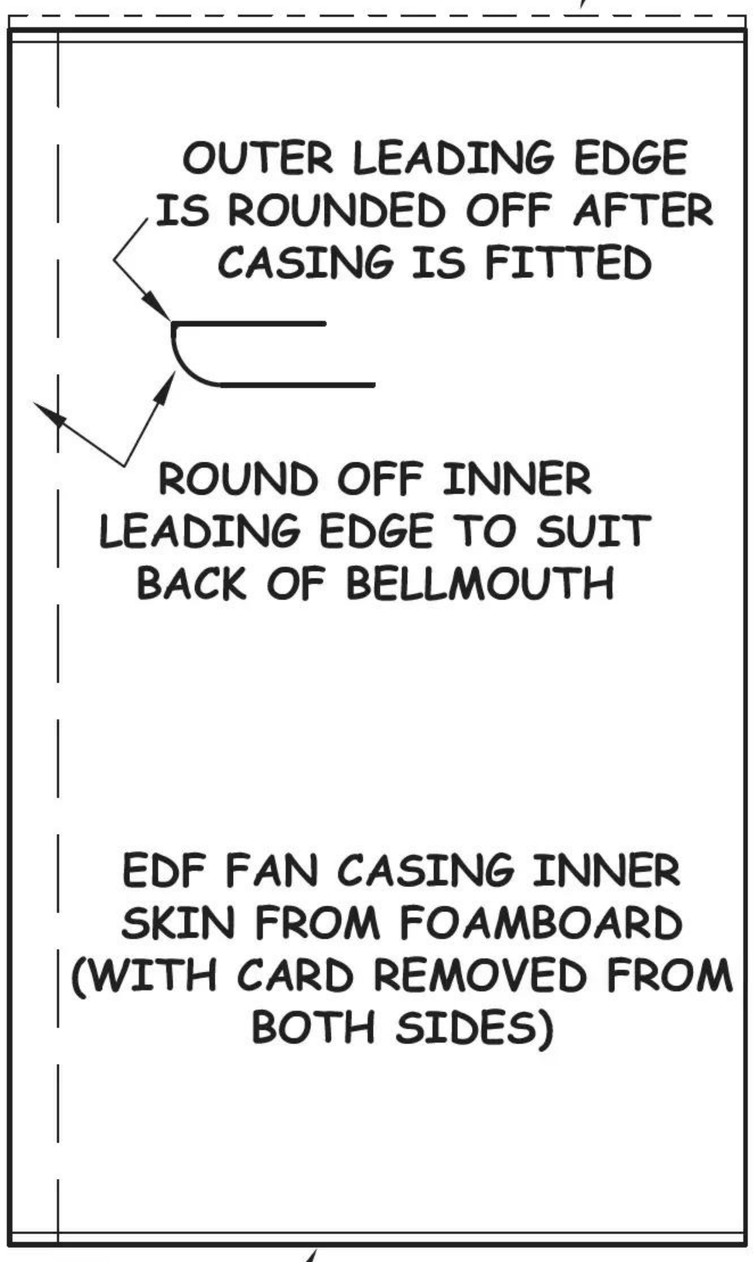
USING 6mm FOAMBOARD

THREE WRAPS OF 3mm WIDE CARD STRIPS TO BUILD UP THE EFFLUX OUTLET

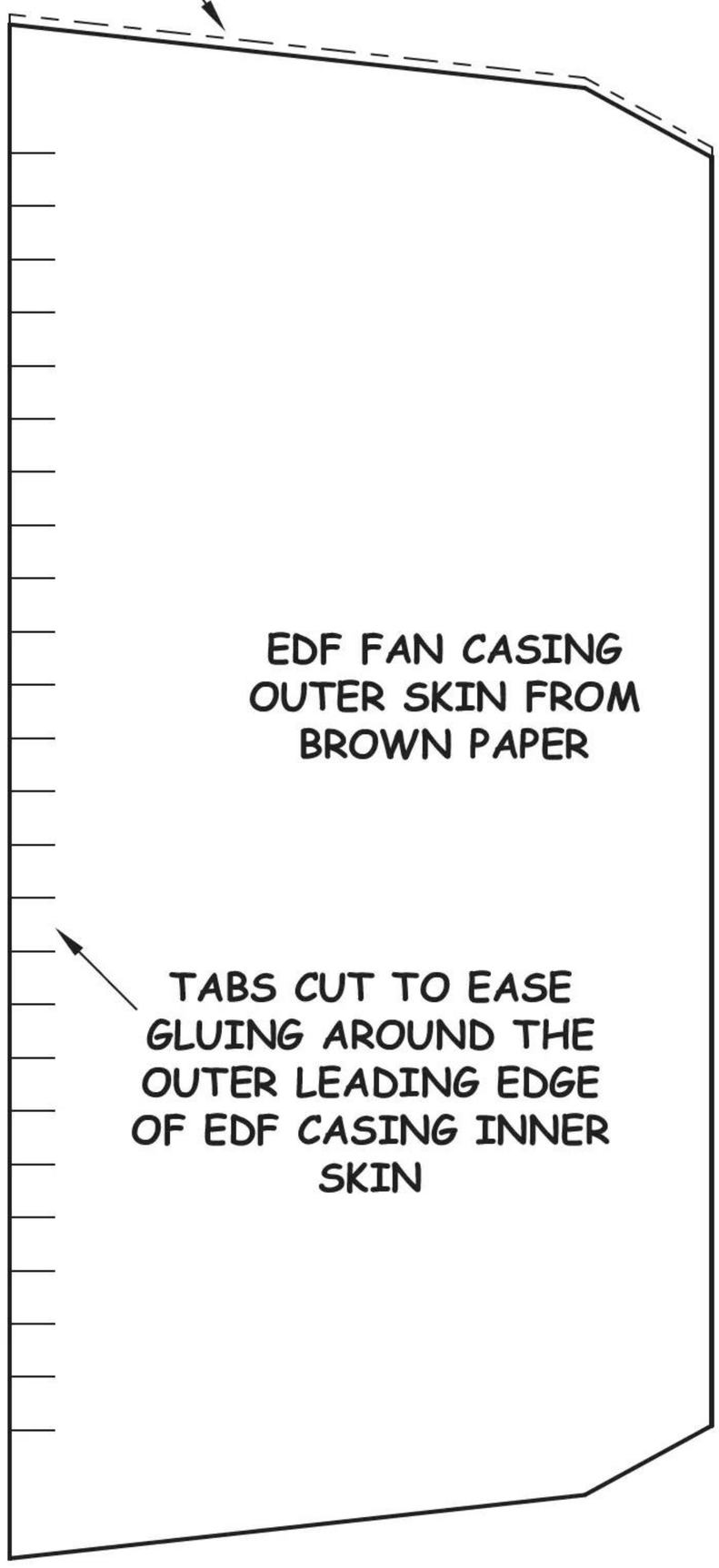


S OF THE EFFLUX
BLANK MUST JUST
WHEN THE FIRST
NK IS WRAPPED
ND THE MANDREL

EFFLUX TUBE
T FROM CARD,
VO REQUIRED,
OULDED ROUND
ANDREL WITH
GLUE SIDES
OGETHER TO
FORM TUBE



SMALL CHAMFER AT ENDS TO ALLOW FOR CURVATURE



THE FAN CASING INNER AND OUTER MAY NEED MINOR TRIMMING TO ACCOMODATE BUILDING TOLERANCES

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TARGET FLYING WEIGHT

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