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VOL. 67 NO. 9 SEPTEMBER 2024

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Welcome

Welcome to the September 2024 issue of RCM&E.

A recent trend in my local clubs is the 3D printing of bird style models and with careful paintwork of their plumage the results can be quite spectacular. Of course, R/C models of birds have been flying for decades, especially as slope soarers, but 3D printers do seem to be the most popular way these days to emulate one of our feathered friends, often powered by an electric set-up to hoist them aloft. And let's not forget the ARTF birds that have been widely available for several years.

We featured one of those on our Parting Shot page last month, being followed by an inquisitive Red Kite. Flying straight and level, with its propeller closed and the bird following behind, the model is obviously of no danger to this magnificent raptor and many of us will have had similar encounters with soaring birds, especially those who enjoy flying gliders from the slope or when thermal soaring. A 'normal' glider is not likely to draw much scrutiny, apart from a distant fly-by, but a bird style model does seem to warrant a closer look, as depicted by Mike Freeman's picture.

I was therefore taken aback to receive a rather unpleasant message saying that if the picture was taken in springtime, then the bird might have had chicks in its nest and saw the bird-like plane as a threat. This may be a reasonable explanation, although I did try to explain that aeromodellers have soared with birds for decades. However, my response was rebuffed in the same disparaging manner.

So, what do you think? I would welcome any thoughts on the dos and don'ts of flying models near to birds and we can discuss the issue in future All Write letters pages. As always, your communications are most welcome but please do keep them friendly and non-threatening.

Okay, let's take a quick look at what we have in store for you this month. John Daniels kicks things off with an overview of a future kit build, the mighty Shock Cub from



Seagull Models which he hopes will allow him to get a regular flying fix from waterlogged fields this coming winter. Next, we welcome back David Ashby who resumes his popular Just For Fun column before we join Shaun Garrity (Retro Ramblings) to look at his nearly completed Krick SG 38 'School Glider'. Lindsay Todd follows on by extolling the virtues of slow flying before Phil Stone shows how to build a T1 Hawk jet from Correx fluted polypropylene sheet. For those who enjoy a bit of model engineering, Peter Vivian builds his first home made diesel using the engine plans designed by Ed Holly. Then it's over to Martin Hardy as he describes the conception, design and build of his Dornier tri-motor amphibian. John Stennard needs little encouragement to keep his Insider model column going throughout the summer and this time he starts with some small gems from MinimumRC before handing over to Dave Goodenough (One Man & His Shed) who puts a worktop on his field trolley before catching up on other shedly topics. Ian Perry polishes thing off nicely as he converts a 1980s ducted fan Sabre kit to electric power.

I hope you enjoy reading it all.
Happy Flying!

Kevin Crozier

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Building your very own model from plan is one of the most satisfying achievement any modeller can experience..... so go on, give it a try and don't miss out on this wonderfully therapeutic side to this great hobby...Tony Nijhuis



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On the cover

Photo: Phil Cooke

The Hawk T1 above needs little introduction. Being a trainer, it is an ideal subject for building and flying as a PSS (Power Scale Soarer) model. Phil Stone first started building in Correx in late 2018 and he has since built countless models, five of which have been Hawks. Correx is a twin-walled, fluted, polypropylene sheet and building a model with it is relatively quick, as Phil reveals in the first of a multi-part feature.

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Brian tends to his Harvard on the hallowed tarmac of RAF Barkston Heath during the BMFA Scale Nationals 2009.

BRIAN'S SONG

Danny fenton pays tribute to the best Scale World Champion we never had.

It is with a sad heart that I heard of Brian Taylor's passing. Sadly, I didn't really know Brian and had only met him the once on a cold and blustery RAF Barkston Heath during the Scale Nationals in 2009.

On that day in August 2009, I approached Brian and shook his hand, thanking him for all his wonderful designs. He must have thought me a fool, I really didn't know what to say. In my defence,

what do you say to the scale modeller that inspired you to build scale models?

I had admired his work and looked forward to reading about his models in the modelling mags of the 70s and 80s while I was still figuring out how to join two bits of balsa. I would while away many an hour 'reading' his plans until I completely understood what he wanted the builder to do. The oft heard mantra of 'deviate at your peril' was so true. Often you would omit a part, not seeing the point until later in the build when the

reason would become apparent, hopefully not too late. Brian's drawings were second to none. His skills as a draughtsman were simply extraordinary; no CAD here, it was all pen and ink.

His flying was silky smooth and his attention to detail breathtaking. His building wasn't shabby either. It was often said that Brian built with helium, his models were so light. It was a real challenge for the rest of us to try and get even close to the final weight of one of his models. I did build a Hurricane from his plans and got to within

a pound, and I was really pleased with that. Very few got close. But they all flew well, even at a few pounds over Brian's numbers. In fact, Brian wouldn't release a drawing for publication until he had all the kinks ironed out and they behaved in the air and on the ground!

I asked around and with help from Graham Kennedy, we got a wonderful response from the scale community. So rather than me write about somebody I only admired, I have attached some words from those that knew him much better than I did.



Pete McDermott, Mick Reeves and Brian Taylor at a very cold, grey and windy Elvington.



Brian's pugnacious looking Bristol Beaufighter with very appropriate unit markings.

Pete McDermott

I probably first became aware of Brian Taylor when spectating at the 1968 British National Championships. These were held that year at RNAS Yeovilton, where I was stationed at the time. With only hazy memories of some unsuccessful childhood attempts at aeromodelling, largely centred around trying to start a clapped-out ED Bee, I ventured onto the Yeovilton airfield to see what it was all about. I told Kath that I would be home for lunch but that never happened as I spent the entire weekend glued to the R/C Scale Flight Line. How things had changed! Radio control had become digitised, neat little transmitters with multi-function proportional control sticks had replaced the large single channel boxes with remote press buttons that I recalled from a decade earlier and many of the models were museum pieces to be marvelled at.

The highlight of the event for me was the winning Percival Provost of Roy Yates. It seemed exact in every detail apart from that particular smell of fuel, oil, rubber and hydraulic fluid so reminiscent with the full size from flying training days. Second place was Mick Charles' Piper Comanche which went on to win the World Championships two years later.

Most appropriately for the venue, Brian was flying a Fairey Swordfish and was the only one of the thirty or so competitors still using reed equipment. Instead of proportional control sticks each function had to be switched on and off as required, all something of a black art and Brian's smooth flying clearly showed that he was a master of that. He would have finished much further up the field had not disaster struck whilst bravely attempting a touch and go and curtailing his flight. From conversations with people around me I gleaned that Brian was something of a local hero and the central figure of the Ilminster club who flew at nearby Merryfield, technically a satellite of Yeovilton but in those days very much a derelict ex-WW2 airfield.

Having now been well and truly hooked on scale model flying I bought some magazines, raided the piggy bank and, following a classified advertisement in RCM&E, met a chap at Poole Harbour car park who opened his boot to reveal a very pretty Sterling Wizard biplane complete with a Merco 35 engine and a set of RCS Digi-5. He switched on the transmitter, wiggled the stick and everything moved around. Money changed hands - what could possibly go wrong!

Shortly afterwards I took my new acquisition to Merryfield, spoke with Brian and asked if he would test fly my model, which he kindly agreed to. Take-off was normal and the model did a couple of circuits before commencing some amazing unrecognisable manoeuvres which I could only wonder at. I noticed Brian lift the transmitter skyward, thinking perhaps this was some ritual prior to landing, which he then safely accomplished. "I wasn't doing any of those things," Brian subsequently announced in what was later to become his familiar West Country accent. "I should get your radio checked, if I were you." I thanked him for his help and advice and duly sent the R/C gear back to RCS for checking, the first of many occasions!

I moved on from Yeovilton, an exchange posting with the RAF and then civilian life but kept in touch with the scale scene through magazines and spectating at scale events whenever I could. I especially followed Brian's activity, always admiring his smooth flying technique,



Brian giving his Spitfire a post-flight wipe down.



Mick, Brian and Pete.

the vast range and diversity of his brilliantly engineered designs and his unique way of achieving a never overdone but so realistic effect in the simplest of ways. He built lightness into his models and their flying reflected that.

By the late 70s / early 80s I had decided to replace scale spectating with participation, first at Woodvale and then the Nationals. Some modest success encouraged me to try a bit harder and I even read the rules to find out what one really should be doing! Eric Coates, the then SMAE / BMFA Scale Chairman, persuaded me to enter my newly finished but as then unflown Sopwith Snipe in the Trials for the 1984 Scale World Championships to be held in France. I felt somewhat daunted mixing it with such scale icons as Brian, Terry Mellany, the then reigning World Champion, and Mick Reeves, World Champion in 1978. To my amazement I found myself qualifying for the team along with Brian and Mick. Brian was flying his Gloster Gladiator but hoped to have a Bristol Beaufighter ready for the WCs, Mick his trusty Hurricane. This GB F4C team remained the same for the next decade, apart from Chris Foss replacing Mick in 1986 and Brian in 1992.

Brian succeeded in getting his Beaufighter to Paris but in the scorching conditions that prevailed neither that nor my Snipe performed as expected and we had to settle for a Team Silver Medal.

The next World Championships were held in Oslo in 1986 where Chris Foss replaced Mick in the team. Brian was now flying his Spitfire 1A which had behaved superbly prior to the event. The site was very restrictive, a last-minute change of venue. The wind, as ever, was across the very narrow runway and my heart went out to Brian as his Spitfire's undercarriage and flaps suffered impact with the rough overrun on the absurdly narrow space available. Chris fared better with his Dalotel but we had to settle for a Team Bronze Medal.

Italy in 1988 saw a change in fortune but not without a few anxious moments. Mick was back in the Team with his first of his subsequent line of Sopwith 1½ Strutters. Brian was flying what to me was his best ever scale model, the DH Mosquito. Towards the end of his first flight the port engine of the Mossie cut, to gasps from the large audience as it dropped its left wing. Brian skilfully managed to recover and had just enough height to flair out and land into wind some way from the landing site. Subsequent inspection showed the left tank empty and some damage to the underside of the Mosquito. Brian rectified the problems overnight and completed further successful flights, enabling us to win the Team Gold Medal.

We went on to win further Team Gold Medals in 1990 and 1992, as well as a few individual gongs along the way. I think Brian's last international participation was in the Netherlands in 1994. It was probably one of the most successful eras in British Scale modelling and is unlikely to be equalled. Brian was a reserved sort of guy but always willing to pass on sound advice when asked. Individual international awards eluded him, but he contributed enormously to the success of the British F4C Team. To many he was the best Scale World Champion that we never had.

Thanks for the memories, Brian. For your company and for your early inspiration. You were one of a kind.

Pete McDermott FSMAE

F4C World, European and British Champion

Continued on page 60.

SHOCK CUB

John Daniels gazes into his crystal ball and sees more wet winter weather to come. Since big wheels are better in soggy conditions, he takes a fancy to the chunky boots fitted to Seagull Models' 102-inch bush plane

Words **John Daniels**

Photos **Kevin Crozier, Seagull Models**

We Brits are usually seasoned wet weather fliers, especially those of us who try to continue flying over the winter and into spring. With our weather, we have to be, but things this past winter, and especially going into spring, did cause me new levels of frustration as even when the sun was shining the ground conditions at many local club flying fields proved to be far too wet underfoot to fly from. And when it wasn't wet, it was very windy!

By wet weather I don't mean that I enjoy going flying when it's actually raining. Personally, I can't see the enjoyment in doing that, especially with the very real risk of water damaging transmitter touchscreens and getting inside via sticks and switches. Rather, I mean those rare times when the rain has stopped for just a few hours and some form of flying should be possible, even though I will invariably need to put my wellies on and be prepared to paddle around in some mud.



The chunky Cub style fuselage with a plastic ruler for scale. It's not a Piper, it's a Zlin!

For the worst of 'normal' winter weather I have a couple of 3S size high wing models fitted with tundra style wheels and these are fine for flying from soggy grass on a mild day. But earlier this year the strips often had standing water on them, although the longer grass in the outfield

was okay to fly from, if only I had a bigger model capable of rolling over the unkempt tufts of turf. Hence my attention turned to a finding a larger bush plane that I could take off with from any reasonably dry area of grass, even if a bit on the long side. I also wanted a larger aeroplane with



It will be a while before my Shock Cub is finished so here's an image courtesy of Seagull Models to show you what it looks like.

“Although the name suggests it should be powered by a 35 - 55 cc petrol engine it's also equally at home with a 12S electric set up”

STOL capabilities that would be less affected by windy weather and, being capable of operating from an unmown area, it would also allow me to take off and land into wind rather than being restricted to those rare days when it was blowing down the strip.

ELECTRIC SHOCK

Googling away, my research drew me to the J. Perkins website where I found just what I was looking for in the shape of the Shock Cub 35-55cc by Seagull Models. This impressive 102-inch span scale model has a fully sprung metal undercarriage and large air-filled balloon tyres, just right for getting airborne 'off-piste', as well as full span slats and barn door flaps for those all-important Short Take Offs & Landings. Although the name suggests it should be powered by a 35 - 55 cc petrol engine it's also equally at home with a 12S electric set up, which is the route that I will be taking. Or is it...

I have just had an interesting conversation with a flying friend and he intrigued me by saying that he was minded to sell all his larger electric motors and ESCs etc. and to go back to petrol power. His reasoning was to dispense of the hassle of charging several large LiPo packs before a flying session, whereas a petrol plane is pretty much ready to go, just needing much smaller (and quicker to charge) radio and ignition packs to be sorted out before flying. Plus, a bit of fuel, of course. I can appreciate all that but for me the real angst starts when I get back from a flying session and need to discharge any unused large packs, as well as putting the used ones back to a storage charge. Winter flying also needs some thought to be given to keeping your LiPos warm before flying with them as using them from cold is a sure-fire way to get lousy performance and possibly shorter life. At least I have that one cracked thanks to my handy LiPo heater box which plugs into my car's 12V output on the way to the flying field - plus a bit of early morning pre-heating in the shed during breakfast!

I'm still a way from needing to decide as although I have a suitable petrol engine, I still need to do a bit of saving up to buy a motor and ESC if I do decide to go the electric route. Decision, decisions!

I also need to buy a suite of seven high torque digital servos, two each on ailerons and flaps, two for the elevators and another for the rudder. Plus, a further throttle servo if I do go for petrol



Tubular undercarriage parts are sprayed gloss black.

power. The minimum recommended servos for the flight controls are 8.8 kg.cm. (6V), 10 kg.cm. (7.4V).

GOING FORWARDS

This isn't a review per se, more of an 'un-boxing' preview as I have some other models that I need to get built first. But I thought that it was worth writing about in case you too are looking



Squashy 5.5-inch airwheels should ride over winter long, wet grass - I hope!



A petrol engine can be mounted on the factory fitted short engine box via stand-offs supplied. Or go electric using the adjustable motor box included in the electric conversion, also included.



for a way to weatherproof yourself for the winter ahead.

Talking of boxes: what a whopper this one comes in! For a bit of fun, I got my wife to photograph me inside it on the hall carpet and only my head and shoulders were visible. There was plenty of room for my middle-aged spread too! For reference, I am just under six feet tall.

LOOKS LIKE A CUB

The first Savage bush plane was made in Italy in the late 1990s. The concept was to create an aircraft with good handling and STOL characteristics using traditional construction and so be easy to build and repair. In 1999 production moved to the Czech Republic and since then it has been carried out by Zlin Aviation s.r.o.

The naming of the Shock Cub is explained on the Zlin website:

"A name that should not only be able to represent our real intentions but could even 'shock' the aficionados of this type of aircraft. The word 'Cub', first of all, aims to express the typical DNA of our production... The word 'Shock', on the other hand... aims to underline some important facts relating to the entire project - to pleasantly 'shock', with specific aerodynamic [sic] features and through the 'shock absorbers' installed on our plane for the first time, specifically designed to be terribly efficient during landing."

Well, I hope that explains things! My interpretation is that the DNA of many of this kind of aircraft emanates from the famous Piper Cub and the Shock Cub does have - well - really big shock absorbers!

As the name implies the Shock Cub is equipped with 'ultra-performing' shock absorbers and the landing gear position has been moved forward to give the full-size machine exceptional breaking capability without the risk of overturning. Zlin say, "*Landing on a bumpy surface will never be easier.*" Which all bodes well for my intended winter flying from a wet and bumpy outfield, although the Seagull model doesn't have brakes.

As for the Shock Cub's wing, the real thing is equipped with a customised 'Hyper STOL profile', with the wing tips shaped to increase lift. The double slotted flaps are 70% larger compared to previous models while the ailerons have been increased by 40% to allow the pilot to maintain full control authority at extremely low speed. Four pivoting slats on the leading edge of the wing also contribute to allowing the Shock Cub to fly at very low speeds and also at high angles of attack.

Zlin say, "*With the slats, its huge flaps and that specific landing gear, a different type of performance can be achieved. Using a low-speed approach and contacting the ground with the tail wheel first,*



Front end is topped off by a nicely moulded and painted epoxy glass cowl.



Tailplane and rudder are very Cub-like. Also seen here is the large decal sheet, with my glasses giving a sense of scale.

spectacular and ultra short stopping distances are achievable. With just a relatively small head wind it will be possible to have almost virtually vertical landings." That all sounds great to me and I will be very pleased if the Seagull model offers a similar level of STOL performance.

There is one drawback, however, "The new slats installed on the Shock Cub will make spin [sic], in practice, almost impossible, while making it easier to control the stall." Super safe, then. I'll save the spins for my F3A style models!

KIT BITS

Upon extracting all the parts from that huge box, the first items that draw your attention are the chunky Cub style fuselage and two enormous wing bags.

Looking at the fuselage first, as you would expect from a modern ARTF kit this is largely complete and ready for installation of the servos in the cavernous cabin area. The elevators are connected via wire pushrods whilst the rudder is waggled by a closed loop set-up. The impressive undercarriage is one of the first jobs that needs tackling and I can't wait to get my hands on those mighty 140 mm balloon wheels complete with air valves. The main undercarriage legs and fixings are fitted next, being weighty items fabricated from tube and folded sheet metal parts, all neatly painted gloss black. The long shocks come next, with one end attached to the axle tube and the other mounted high up close to the windscreen.

Attention then turns to the fitting the engine. If going the petrol route, then this involves mounting your chosen gasser to the pre-fitted engine box with the stand-offs provided. A large fuel tank complete with clunk and twin vent fittings is supplied. If electric power is your thing, then a supplementary motor box is supplied to extend the mount closer to the front of the handsome epoxy glass cowl. A LiPo mount and



Fixtures and fittings all look to be usable and to a good standard.



Neat steerable tailwheel parts include a leafspring mount and a cast wheel yoke.



Clear mouldings are supplied for the cockpit windows and windscreen.



When spending a not insignificant amount of money on a kit it's nice to see a decent manual included. That's not always the case these days!

fittings are also to be found in the EP conversion kit supplied. Finishing off the nose area is a 2.75" plastic spinner with a metal backplate.

Moving to the tail, the horizontal stabiliser is perhaps the most Cub like of all the parts of this aeroplane. I chose the Cub Yellow scheme (a black and silver version is also available) and this bit looks just like it has fallen off a J-3, as does the similar flat plate rudder. The fin is ready built as part of the fuselage structure. Bracing wires are supplied to fit on either side of the fin and tailplane.

The steerable tailwheel assembly is worthy of note, being a working leaf spring type with a neatly cast and machined wheel yoke.

As with any Cub style model the cabin requires a large amount of glazing for which a selection of clear vac-formed parts is supplied. A hinged starboard door gives access to the servos, receiver and batteries mounted on the cabin floor. A pair of seats are supplied, but no pilot figure. The seats are moulded from plastic with balsa back and base pieces and come mounted on a large cube of balsa which needs gluing to the cabin floor. They are neatly finished but are sprayed in gloss brown, so you may want to do a bit of work on them to make them more leather like, and maybe add some seat belts.

The cabin roof and windscreen are catered for with a large one-piece clear plastic moulding.

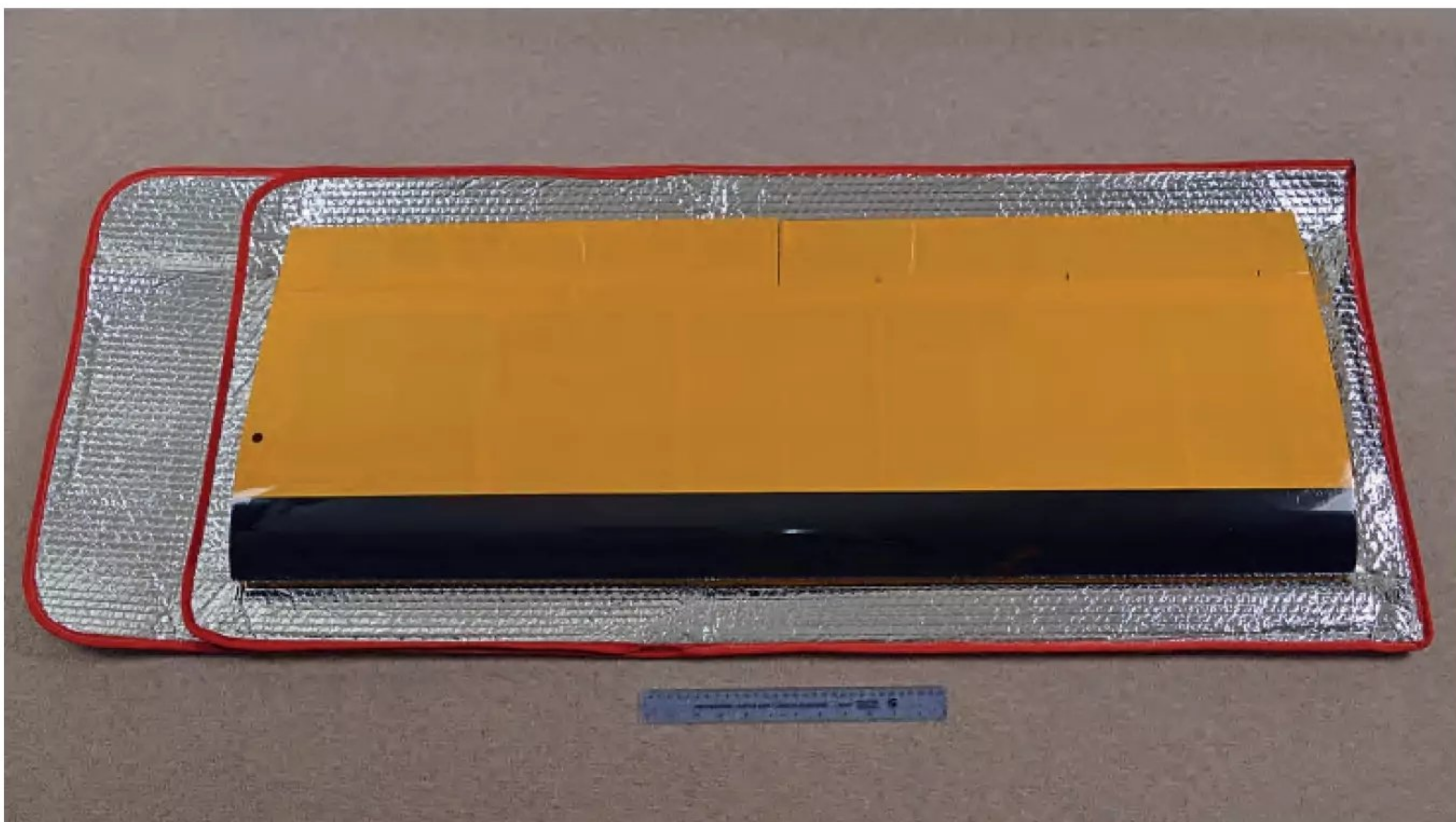
FLAPS & SLATS

Time now to look at those mighty wings, each of which comes in a neatly stitched protective wing bag. At first glance the bags seem far too big, but I guess when each panel has been fitted out with its fixtures and fittings, not to mention those large flat plate wing tips, any excess will be swallowed up.

The first job in the manual is to fit the leading-edge slats. Having purchased a couple of expensive models recently I have been disappointed by the complete lack of any instructions, either supplied with the kit or



Flat plate wingtips.



Shock Cub wing panel resting on its quilted wing bag. There's lots of space inside which I expect will fill up with slats and struts.



End detail of the full-length slats.



Hinge detail of one of the shrouded flaps.



All the long bits laid out, including the ali wing tube, aerofoil shaped wing struts and the uber long shock absorbers.

available to view online (even that's a bit of a cop-out in my opinion!) so I was very pleased to see a comprehensive 50-page printed instruction book to work through when the time comes to assemble my model. Anyway, back to the slats... These are mounted on pivots as per the full size. On the real thing the slats are free to pivot according to the airflow and are not spring activated, but the manual doesn't say whether the model's slats should be left loose to replicate this or locked in a fixed position. I don't have any experience with slats on my models so if anyone

has any feedback on freely pivoting slats relating to scale models (not full size, thanks!) I would be pleased to hear from you. I guess it will be fun finding out, but I'll probably lock them in place with equal size gaps for the first few flights just to be on the safe side.

The barn door flaps and ailerons are factory fitted so just require the fitting of the epoxy-glass sheet control horns and fitting the servos, which are mounted on the underside of each servo hatch. Linkages are via straight metal pushrods with kwik-link style metal clevises.

“As with any Cub style model the cabin requires a large amount of glazing”

The wing is braced by a multitude of aerofoil shaped struts and bent flat plate fittings. As with the undercarriage these parts are all neatly painted gloss black.

IT'S A WRAP – FOR NOW!

I hope this article has given you a good insight into what awaits you if you buy this impressive kit. As I said before, I have a few other models to finish off before I can spend the time putting the Shock Cub together. But no doubt you'll be hearing all about the build and the short field performance of this characterful bush plane in the near future, hopefully well before the next onslaught of wet and windy weather that heads our way over the Atlantic! ■



Another Seagull shot showing the Shock Cub in flight.



Let's finish with a couple more pictures from Seagull Models. The first shows a rear view of the Shock Club with its barn door flaps deployed.

DATAFILE	
Model:	Shock Cub
Model type:	ARTF bush plane
Scale:	1:3.5
Manufacturer:	Seagull Models
UK importer:	J Perkins https://www.jperkins.com
RRP:	£911.99
Length:	1733 mm (68.2")
Wingspan:	2590 mm (102")
Weight:	9.6 kg (21 lbs)
Wing loading:	75 g/dm ²
Wing area:	1803 sq. in. (116.3 dm ²)
Engine size:	35-55 cc petrol or 12S electric
Servos:	Flight controls (7), throttle (1)
Functions (servos):	Ailerons, elevators, rudder, throttle, flaps

I've spent more time on the comp' flightline over the last couple of years and very good it has been.



Back with his sport flying column, David Ashby returns to his R/C flying roots and finds himself hooked

Words & Photos **David Ashby**

It's me, back again. Here's hoping you're well and still at it. As in the past *Just For Fun* will feature the eclectic mix of projects, people and bits you may remember.

To kick off I thought I'd tell you about the local glider comp's I've been attending since I saw you last. A few years ago, when I worked full time on the editorial team at RCM&E, our contributor, Loris Goring would often phone for a chat. A lovely gentleman, Loris had a thing for thermal soarers, I don't think he flew anything else. His passion for the type extended to recommending them for beginners and just about anyone else in fact. If we featured something that was two-channel, all-balsa and thermally then Loris would always call to offer his congratulations.



Needless to say, don't let your eye leave the model for one moment. No, really...



An Interclub regular, the Bromley Club's Alan Twine guides his F5J machine down to the landing spot.

I get it, I like 'em too. They're pretty easy to fly yet challenging to fly well. We're talking 'lift' here, extending flight duration by finding those elusive rising puffs of air. To do this without using a motor/recovery system isn't easy at first, but immensely satisfying when things come together.

Perhaps the seed was sown some 40 years ago, back when thermal soaring was hugely

popular, especially down here in the South East. Back in those days most clubs could field a team or two for every competition. Around that time, my first R/C model was a thermal soarer. That Bowman's Super 100 was all-balsa with a tissue covering and certainly 'of its time'. It competed on a couple of occasions although certainly didn't frighten anyone.



Tow winch fans Ian Nicholls, Greg Hayfield and Iain Stingemore, all from the Bloobirds Club.



My mentor and serial winner, Keith Fisher, launches Richard Harris' Prestige.



Nick Jackson watches Eddie Small arrive. Both from the Canterbury Club.



Ian lets go. There's plenty of technique required to using the line effectively.

INTERCLUB

Fast forward to the present when, a couple of years ago, my club received an invitation to re-join Kent Interclub (KIC), a club of clubs that runs a series of thermal soaring competitions from April to October every year. Perhaps population density has helped but no other UK county has such a group. KIC started in 1976 and some of the founder members still compete. These days Interclub's main disciplines are F5J and Multi-Launch (ML). Both are for electric powered gliders with the latter offering a more relaxed format for machines both powered and unpowered (an electric launch winch is provided). KIC still hold the UK's oldest thermal comp, the Towner Trophy, that started in Sussex in 1968 and moved to Kent later.

F5J

You've probably heard of F5J and, simply stated, it's an international class for electric gliders with a span of 4-metres or less. To quote the BARCS website:

...the aim is to use the minimum launch height possible to achieve the maximum flight time within the 10-minute working time. With launch height penalties in place the best flights are a judgement on pilot skills and risks using short motor runs and low launches.

So it's a case of 'who dares wins'. You launch, then choose your own motor cut-off height within 30 seconds, try to stay up for 10 minutes ✈



If the farmer has a cherry picker, then so much the better.



Not all models have to be expensive all-carbon jobs. Seen launching here, Bob Hope from the Tonbridge Club always puts in respectable scores flying his own-design all-balsa models.

“We’re talking ‘lift’ here, extending flight duration by finding those elusive rising puffs of air”

(without using power, obviously) before a spot landing. Extra points are awarded according to how close you land to the spot but the real skill comes in judging the cut-off height then finding lift. The lower you chop the power so the more points you retain. All other things being equal, the difference between shutting the throttle at, say, 100m compared to 150m can often decide whether you win the round or come last. It probably goes without saying but telemetry units that relate height back to the pilot aren’t allowed.

In practice, at an internationally competitive level, motor cut-off heights can be insanely low, 20m, perhaps a tad more. A widget in the model records the motor cut-off altitude which, along with your flight time and landing score, are fed into the computer that crunches the numbers and places each round’s contestants. KIC comps usually see five to six pilots flying a similar number of rounds in a day.

It sounds simple, but of course there’s far more to it than that. Launching techniques vary; some ascend to their cut-off height while others stalk about watching for lift and checking what others are doing before a quick burst of power at the last moment. There’s also a slingshot technique that works by building speed in a tight low circuit then cutting power and using the model’s energy to find height. It’s fascinating to watch. Using power a second time - even accidentally - will scrub that round’s score although the occasional burst to avoid a mis-judged tree or prevent landing out isn’t uncommon.

MULTI-LAUNCH

I flew in two ML and two F5J meets in 2022. Pilot numbers vary but my first comp’ saw 17 flyers from 10 clubs present. Flying lasts all day, starting at 10am after a briefing. Results are announced late afternoon.

Like F5J, ML wingspans are limited to 4m, but that aside, any machine can be used whether a foamie, balsa or carbon/glass creation. Radian XL and Easy Gliders have appeared. A couple of flyers were campaigning classic balsa soarers or ‘bitsa’ creations. But the majority were flying the more bespoke F5J-class all-moulded soarers.

Initially, without a competitive machine, I took a 2.5m span RCM Pelikan Pike. It’s an effective thermal seeker but over 20 years old and too small to match the modern 4m span models that actually weigh less. Although I placed mid-table for landing points, overall I



A colleague has the timer and is an extra pair of eyes to spot for signs of lift and what everyone else is up to.



It can get busy at the landing spots as the timer approaches the 10-minute mark.

finished in a table-propping position, but did meet a nice man called Keith who sold me a 3.75m span Cluster that’s all-moulded and still competitive(ish) on the right day in the right hands. It’s some 20 years old so practically vintage. I’m the 4th owner and a glance at the airframe revealed some, ahem... ‘adventures’ over the years. All-up it weighed around 2200g, nowhere near the 1200-1500g modern contemporaries top out at, but it was a big improvement on the Pelikan Pike.

The next comp’ was at the Sittingbourne Club a month later. It was very windy, too windy some said, but, somehow, I managed to finish second. It was a fluke of course but how on earth had that happened? Well, like I said, it mostly far too windy to find or stay in passing lift so my strategy was simply to find height and sort of slope soar without the slope. Some of the lighter models got blown about a bit. Comp’



Terry Letchford from the Sittingbourne Club with his modified Radian XL that has performed well.



Nosing over will be a distant memory if you do what my friend Bill has done to his Spitfire. It's not particularly noticeable in the air either.

buddies take reassurance that nothing like that has happened to me since.

But that hasn't mattered. The attraction comes in seeing how other flyers go about the whole thing, how they launch, fly, find lift and finish. A reminder if any were needed that, where model flying is concerned, there's always something new to learn and absorb. Watching some of the experienced pilots demonstrate their technique and skill has been an eye opener. Sure, some people take things a bit more seriously than others, that will always be the case, but it's a friendly environment, everyone helps each other and, dare I say, my thermal flying has improved a bit.

ONE STEP FORWARD...

The Cluster is a really nice model to fly but that weight couldn't be ignored. I needed something lighter. A machine that would improve my chances of rising a few places in the table if I managed to fly it reasonably. Last year didn't work out so well. I got along to one competition, but family and carer duties intervened at other times. And I managed to stuff in a new model, an Infinity Evo.

I'm still not certain what happened although, when I related the circumstances, some knowing nods were evident. Mine won't be the

last model lost to a collapsed battery, although that didn't make me feel any happier.

STORKING

Dedicated competition pilots buy the latest models, then sell their older airframes to help fund the purchase. Those who can't yet justify having the very latest and most expensive machines are their customers. People like me. It's about putting the word out, then moving quickly when something becomes available. Earlier this year word came back that a new Stork 8 was going for an attractive price; it was soon in my workshop.

The Stork series was made by Patrik Heinrich in Slovakia until his passing in 2022. The '8' was the last of the line. Spares are no longer available, but I was happy to take my chances.

Buying a used model has some drawbacks,

especially one pre-fitted with a power system and servos. Despite what a seller may say, you just don't know how well the electrical bits have been installed or treated afterwards. They may have had an easy life, or a good thrashing. Airframe condition may provide some clues, but not always. And one person's 'easy life' is another's 'good thrashing'. My Stork was a new untouched and unflown airframe that had been tucked away for a while. It required fitting out but that's just how I wanted it.

The 2024 competition schedule has been devastated by poor weather and unflyable fields down in this part of the country, so my Stork has yet to compete, but perhaps the loss of the Infinity has been a blessing in disguise. It may have been me, but I didn't take to the model in the same way I have with the Stork. That Infinity just didn't feel as composed in the air. I'll let you know how I do going forward but, for now, I just need to accrue some Stork stick time.

TRIKE SPIT

If you've a tail dragger warbird that's always nosing over no matter how much you lean on elevator then my flying buddy Bill has the answer. You sometimes see ideas that, on the face of it, don't seem so good but, in practice, turn out to be pretty neat. At first glance his nose leg just looks wrong, but in practice it works brilliantly. It's perfect for bumpy surfaces or grass fields that are mown infrequently and it's pretty inconspicuous in the air. The wire legs themselves can hardly be detected when his Spit flies and while the nose wheel isn't invisible, it could be replaced by a transparent disk if the sight of a small black dot flying in tight formation bothers you.

LIDL TIME

The £7.99 foamy chuck glider from the large discount retailer remains very popular, particularly with slope flyers. A Mk.2 version appeared a little while back with a slightly wider fuselage and a tapered wing trailing edge contrasting with the ✈



My Stork 8. It's well made and, importantly, handles well (Graham Ashby photo).



Lidl still sell their £7.99 foam glider. Slice off the tail and you've an agile little sloper.



Scoop out the interior and there's plenty of room for a receiver and battery.

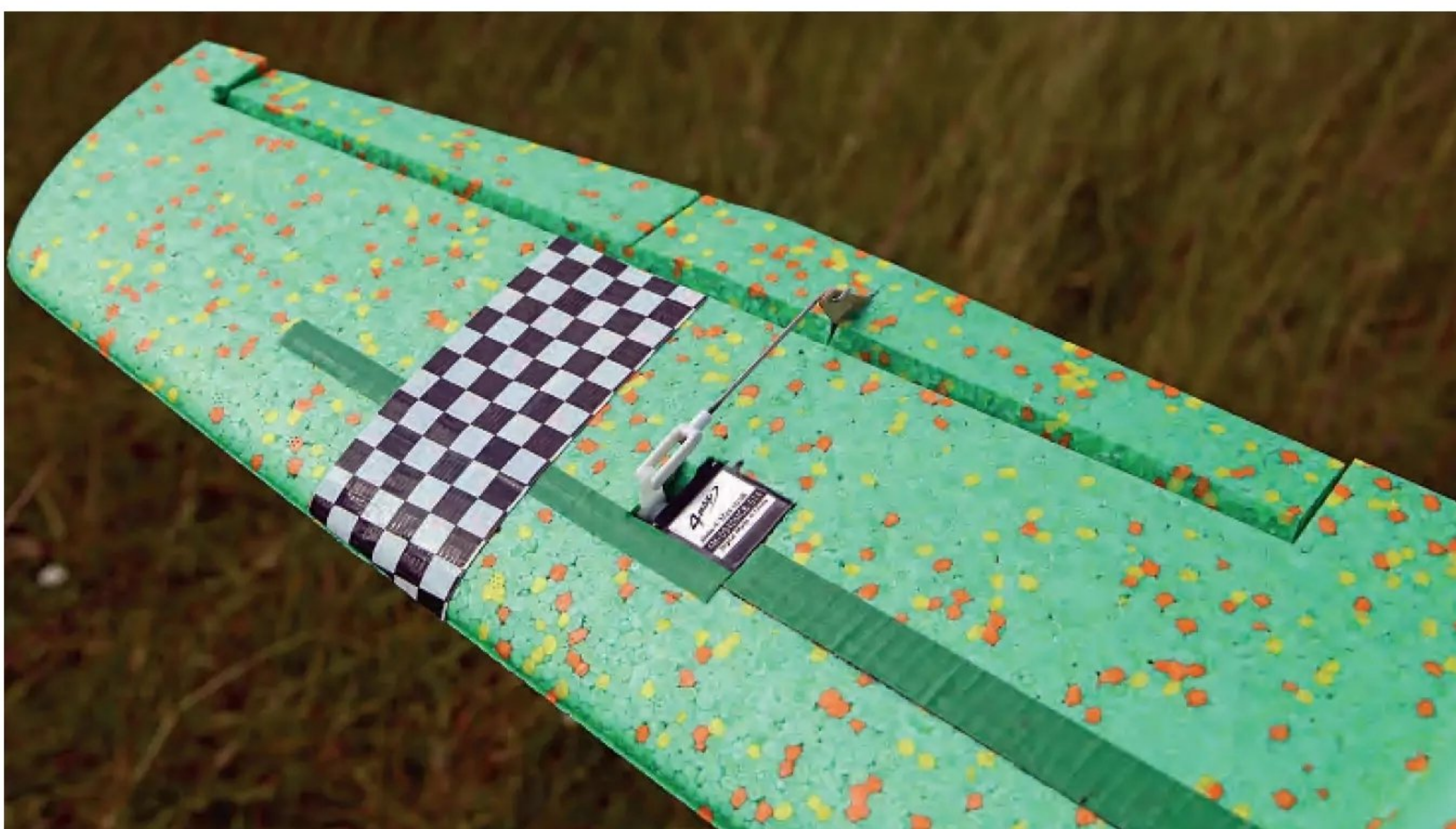
“The result of that modest effort is a tough and agile little sport wing that also makes a great combat glider”

Mk.1's blunt offering. Aficionados say it flies a tad better but either type offer the very best fun/cost ratio you'll find in the hobby.

The R/C conversion options are many and varied. A quick Google will reveal a terrific amount of creativity, although some fly better than others. A flying wing conversion seems to offer the best slope flying option. A friend, Charlie Johnson, has had success with his so I copied him.

Instructions seem superfluous but:

1. Carefully remove the canopy and scoop out an interior space.
2. Cut away a small slither of foam from each topside where the wing cranks. Fill each with epoxy and weigh the wing down flat while that dries.
3. Fit a carbon wing spar on the underside. Mine runs from nearly full length, stopping about 10 cm short of each wing tip.
4. Cut out two recesses to suit your servos. I used small thin metal gear 9 g jobs.
5. Cut small slots for the servo leads and a hole in the fus' so they can pass into the canopy hatch.
6. Extend, then cut out the ailerons. Bevel the aileron L.E.
7. Cut off the tail. My wing T.E. to rear fus' measures 130 mm.
8. Refit the fin or, like me, use a stabiliser half.
9. Tidy up and hide the wiring/joins with tape.
10. Devise your own canopy retention method. I used a tab and magnet.
11. Fit a receiver and battery.
12. My C of G is about 20 mm behind the L.E. root.
13. Reflex (both ailerons up) is 3 mm.
14. Deflections are 5 mm +/- on everything, with 35% expo to soften the feel.



A carbon rod supports the wing.



Gary Parker launches his 3.8m Pulsar at our 'longest day' slope session. Gary deserves a medal, being the person behind the endlessly useful Slopehunter website.



It may have been the 21st of June, but it was chilly on that hill.

A small 2 or 3S LiPo battery provides power via a little UBEC in my case and my model required 5 g in the nose to balance. The result of that modest effort is a tough and agile little sport wing that also makes a great combat glider when pitted against similar types, I find myself putting it in the car whenever I head off to the slope.



Clubmate Jim Beagley hovers into the sunset.

LONG DAYS

Evening fly-ins to mark the summer solstice - the longest day and shortest night - are popular at my power clubs and with the local slope posse too. Luckily, the meetings this year weren't all on the 20th of June so I got along to several.



The 'golden hour' when the wind drops is one of the best times to fly.

“Evening fly-ins to mark the summer solstice - the longest day and shortest night - are popular at my power clubs”

My local hill has a tradition where everyone takes to the air as the sun sets, with 10 pilots getting up at around 9.20 pm this time. The mixture of models managed to avoid each other but it was surprisingly cold, so we were heading home not long after.

It was the turn of my power club a few days later when, after a hot day and clear skies, we flew till 10 pm. The pollen was off the scale, so my head nearly exploded, but some things can't be avoided and a very pleasant time was had by all. After the wet and windy months previous it felt like we'd earned it.

INCOMING

Finally, news of the latest EDF jet from Tony Nijhuis. Unlike the VTOL EDF Harrier project he described in the Dec 2017 issue, this one is a conventional hand-launch design that uses a single 70 mm fan and 4S LiPo battery. I met him to point a lens at it recently and can confirm that it looks and flies really well, and those underside fins/hard points provide good grip for launching. Look out for the plan in these pages soon.

That's all for now but I'm back the issue after next so justforfunrcme@gmail.com is where you'll find me in the meantime. Drop me a line and tell me what you've been up to since I was last here. ■



It flies as good as it looks.



TN with his latest creation.



Just the ailerons and wing servos need adding to my Krick SG 38, along with a few vinyl decals and its done. Phew!

SCHOOL GLIDER

Shaun Garrity closes in on completion of a decades old build project

Words & Photos **Shaun Garrity**

Spurred on by my reignited love of all things wind powered (see 'SAS Fleet' later) I decided to get my finger out and finally finish my quarter scale SG 38 glider for the Ivinghoe Retro Glider Event this year (in September, I believe). This model has been a bit of a millstone around my neck for more years (decades) than I care to remember and I've nearly sold the unfinished project on more than one occasion. Originally released in 1984 by Krick, this definitely isn't a build for beginners or people with little patience; it has hundreds of parts with many metal items having to be fashioned from brass strip. Anyway, I thought you may be interested in the history of this strange, rudimentary glider and some build guidance from my experience to date, so please read on.

SG 38 SCHOOL GLIDER

Designed by Schneider, Rehbarg and Hoffman in the 1930s at Edmund Schneider's Grunau factory, this high wing, single seat, cable braced School Glider (also known as the Primary Glider)

was essentially designed for basic flight training by the Nationalsozialistisches Fliegerkorps (NSFK), Hitler's paramilitary organisation that effectively took over the previous German Airsports Association.

The concept was to produce a low cost, easy to fly and repair glider capable of being launched by a bungee cord down a gently sloped hill. At 10.4 metres span, 104 kg empty weight, a glide ratio of 10:1 and a max speed of 71 mph it was perfect for its intended purpose of training. It wasn't a groundbreaking design, but it improved on many features of similar aircraft of the time such as having a shock absorbing skid (perfect for the arrivals of ab initio pilots) and aerodynamic features to improve stability. Simply covered in doped fabric, around 10,000 were manufactured over its production life.

As detailed above it was well known for its role in training Luftwaffe pilots prior to WW2 to achieve the vast numbers demanded by Hitler for his future aspirations. The most famous site for this was at Wasserkuppe,

just north of Oberhausen, using the bungee launch method.

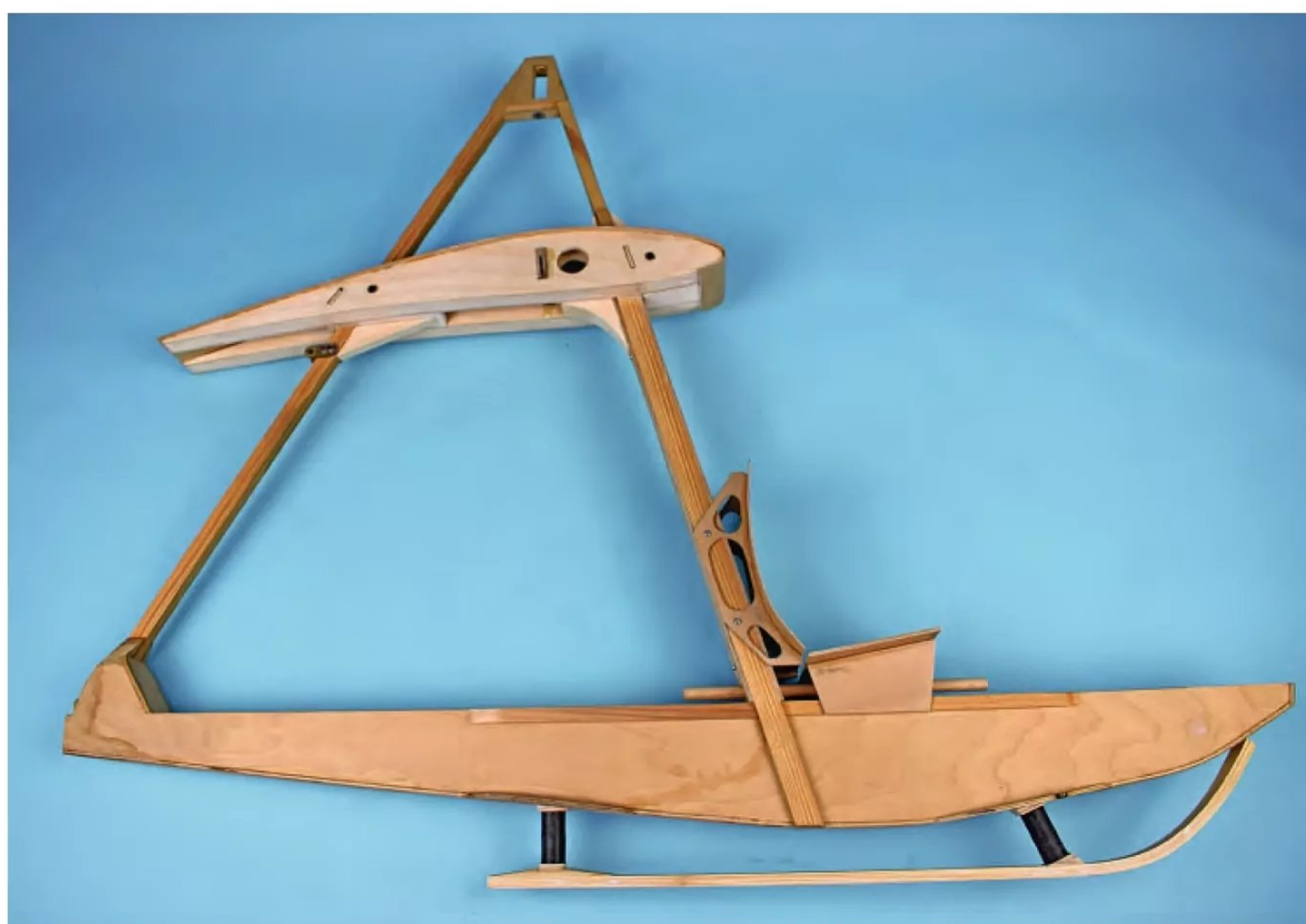
So, why the interest from me? Well, as a young and very enthusiastic glider pilot we had an SG 38 in the hangar at our club. Actually, I believe it was the RAF version, manufactured by Slingsby and designated the T.38 Grasshopper. Another very similar UK manufactured version was called the Elliotts Primary EoN (also known as the EoN Type 7 SG 38 Primary), which was also used by the Air Training Corps. When the cloud base was too low to safely fly, we would attach the SG 38 to a Land Rover with a shortened tow rope and merrily skim around the peritrack.

THE MODEL

In 1984 Krick released a quarter scale, 2.6 metre span kit of the SG 38. Its construction was very close to the full size with the only real compromise being that the fuselage was widened slightly to accommodate a standard servo of the time (today this wouldn't have been necessary with modern, high powered midi



There was an unbelievable amount of wood crammed into this relatively small box.



The fuselage is constructed in two parts that are joined by metal plates and bolts, very similar to the full-sized aircraft.



This must be the simplest 'cockpit' of any aircraft, but it needs doing well as it's very much on view.



Working pulleys guide the rudder and elevator cables, just like the full-size.

examples) and the wing ribs simplified and cut from balsa and ply.

I had to have one, so I viewed the kit at my local hobby shop. There the enthusiasm waned at a rate of knots; it was essentially mostly of ply construction with lots of balsa as well. Many parts needed cutting out, along with lots of brass fittings requiring filing and drilling to shape. As a typical 28-year-old, starting a family, I had more important things to do with my time than

assemble the 800 plus items included in the kit. (I understand that the latest kits have a higher degree of prefabrication than my early one so this should speed the build time somewhat.)

Roll on a few years and I had the opportunity to buy a part started kit at a bargain price, so I did. Its previous owner had similarly had the enthusiasm sucked out of him by the huge time commitment necessary when making this fantastic replica. I made quick progress with the

tailplane and rudder then hit the wall again, so it went back on the shelf for many moons until I gave myself a good talking to last year and decided to get it done - especially when I saw that the price of a new one was now around £450.00!

What's that old saying, 'A job shared is a job halved.' After a quick chat with my modelling mate, plus bribing him with a 1/7th scale Mitsubishi Zero I decided I didn't want any more (built but needing covering etc.), a mountain of bits for the SG 38's wings were duly plonked on his building board, with the only caveat being that he didn't finish the Zero first.

I think you will have gathered by now that this model is a true aeromodeller's aircraft and it takes a lot of time and skill to build; it's definitely not for the beginner or impatient builders. Also, due to its appearance you can't hide dodgy construction behind paint and covering so a lot of attention to detail is required to give this model the justice it deserves.

During research for this article, I also found a 3.4 metre wingspan third scale SG 38 kit available from Valueplanes at approximately the same price as the quarter scale Krick. It's a slightly different version, with a rudimentary cockpit, but having seen the contents of the larger model I would guess it would take no more time to build than the Krick kit. Obviously, you'll need a larger work bench, more covering, heftier servos and a bigger vehicle to transport it but the model can easily be broken down into smaller sections. The cost difference of the build shouldn't be that significant.

THE BUILD

I'm not going to give a blow-by-blow build log as the model is intended for experienced builders. Rather a few guideline notes.

I would suggest attacking the fuselage and tail boom first as once its built it only needs minimal covering at the rear of the boom and the top of the pylon, so you'll quickly (relatively) end up with the finished item to spur you on. The landing skid is laminated from strip; if you can't find a suitable former to produce the required curve (such as a tin can) then it takes next to no time to knock one up from a suitably sized scrap of wood. Make sure the pulleys for the pull-pull wires, built into the fuselage, run freely as once in place they would require major surgery to extract and fix.

The tailplane, elevators and rudder are traditionally built items and presented no issues. Next, I set about the wing centre section, taking note of the instructions *not* to glue it to the wing pylon at this point; the time to do it in the build sequence is well documented.

You'll need a good few cups of coffee ready when building the wings. There's no beating around the bush here as they need several hours of work but for trad aeromodellers this is just as enjoyable as flying and like all other elements of the build its well documented in the instructions. As mentioned above I swerved the build of the wings as a deal was done with a mate who fancied the job. I would have eventually built them myself, but I had too many other irons in the fire at the time and wanted to get skyward with the SG 38 as soon as possible.

OLD PARTS

One downside of old kits is sometimes parts degrade and this happened to some of the





The pylon on top of the fuselage has an adjuster to tension the functional flying / landing wires.



Almost finished, this seemingly never-ending build has rewarded me with a superb model.



Servo operated tow hook and aero tow release mechanisms will be fitted after the test flights. That's assuming the front of the model doesn't need oodles of lead to get it balanced up.



SAS Venom, like the Wildthing, is a very simple and quick build model.



I refurbished the pilot's faded overalls with watered down acrylic paint. It's almost as good as new. Mustn't forget the boots though!



40-year-old ply wing ribs that had warped and twisted. Repeated steaming and weighting down failed to straighten them up, but fortunately a mate of mine had the ability to laser cut some replacements, so problem solved. As previously noted, the model structure can be seen when covered (unless you make the silver painted RAF Grasshopper version), so neatness and accuracy is paramount. Take your time, enjoy the process and you will end up with a model to be proud of.

Heavyweight tissue and dope are suggested in my 1980s kit but I covered mine in Solartex and some old Polytex (remember that?) I suppose I could have used tissue over Mylar but as the Tex was going spare and my local slope isn't kind to fragile coverings, it was the logical choice. To prevent the exposed plywood on the fuselage and the Solartex covering getting grubby I've given the entire model a couple of coats of spray polyurethane varnish. It actually makes it look more authentic as the original was doped.

Of vital importance is setting up the pull-pull wires for the rudder and elevators accurately. Make sure they are bind free, tensioned correctly and have no chance of slipping off the pulleys. The same applies to all the rigging wires; remember these are needed to maintain the integrity of the airframe and are not just for show.

NEARLY DONE

I'm almost at the finishing post. The ailerons need hinging and the aileron servos, pushrods, elevator cables, Rx and battery all need installing, plus there's the landing and flying wires to make up. Also, the vinyl cutter needs firing up for a few bits and bobs as the old

waterslide transfers disintegrated when I tried to use them.

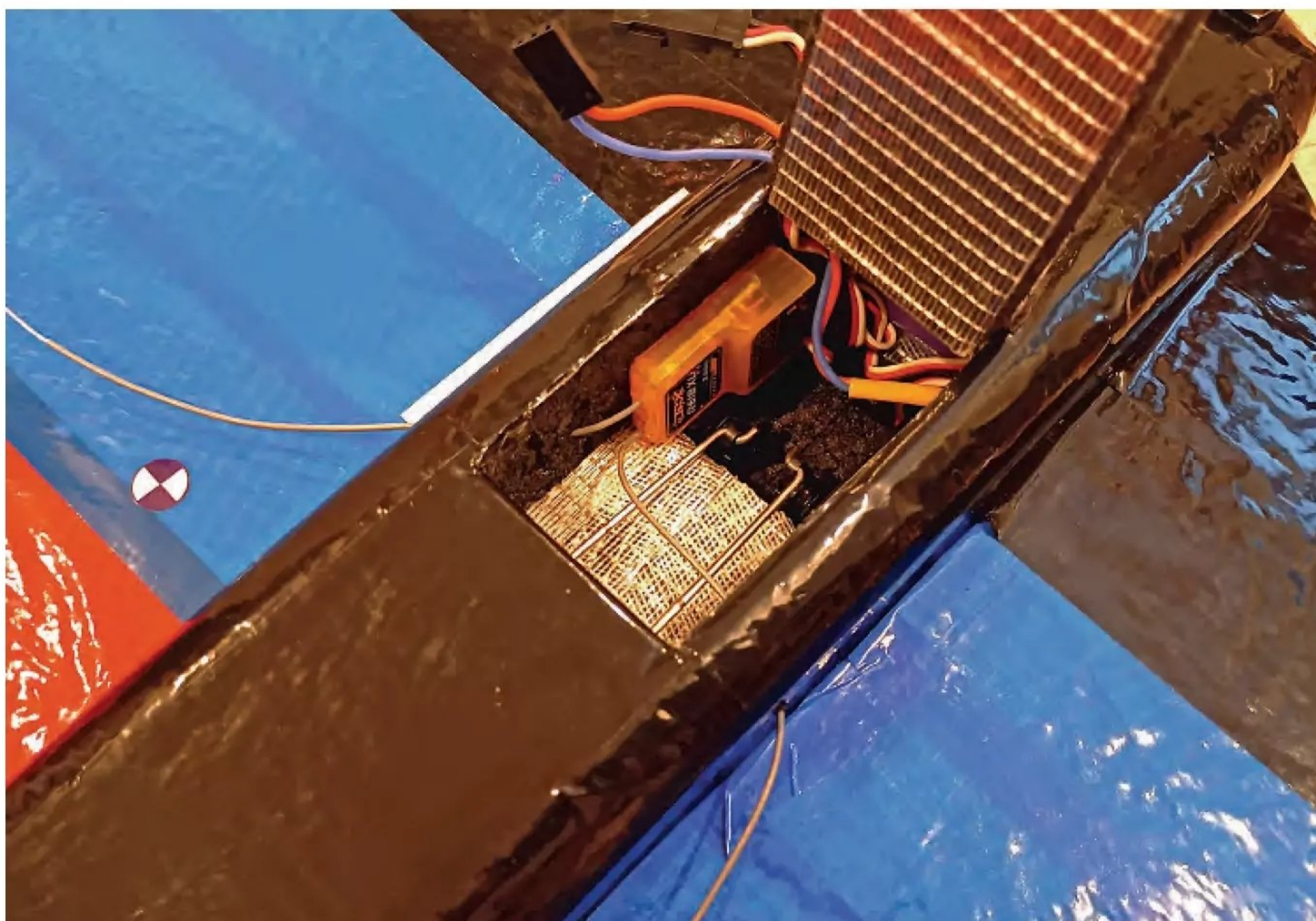
I managed to pick up a very faded and tatty 1/4 scale pilot cheap. I spruced it up by re-painting the head and used water thinned artist's acrylic paint to redo its overalls after my wife had got to work with a needle and thread repairing a few seams. Like Clint Eastwood once said in a film, 'a man has to know his limitations' - and when it comes to needle work, I'm extremely limited! The result, for such little effort, is great.

I've decided to make a couple of mods to allow aero towing and will replace the tow hook with a servo operated version to ensure a positive release when using a bungee or winch launch. This still needs to be done but the end is in sight and I can't wait to get it skyward.

At the time of writing the 1/4 scale Krick SG 38 kit is currently available from Sussex Model Centre, priced at £446.00.

SAS FLEET

In my last column I featured a great slope-soarer from my past called the Wildthing. Designed by Alan Head of Soar Ahead Sailplanes this seemingly indestructible, chunk of well-designed foam has provided ✈



Radio compartment is a little snug but with careful planning it all works out fine. The flight battery is built in so use a new one to prevent future problems.



Andy from Angelwing Designs provides scale to the SAS Venom prior to its test flight.



MATStarget drone ready for test flying and resplendent with faux bullet holes.



This is a little mod my old pal Phil Smith of Veron used on his models, especially ones with swept back leading edges. The ply discs stop the wing bands slipping off oily wing dowels.



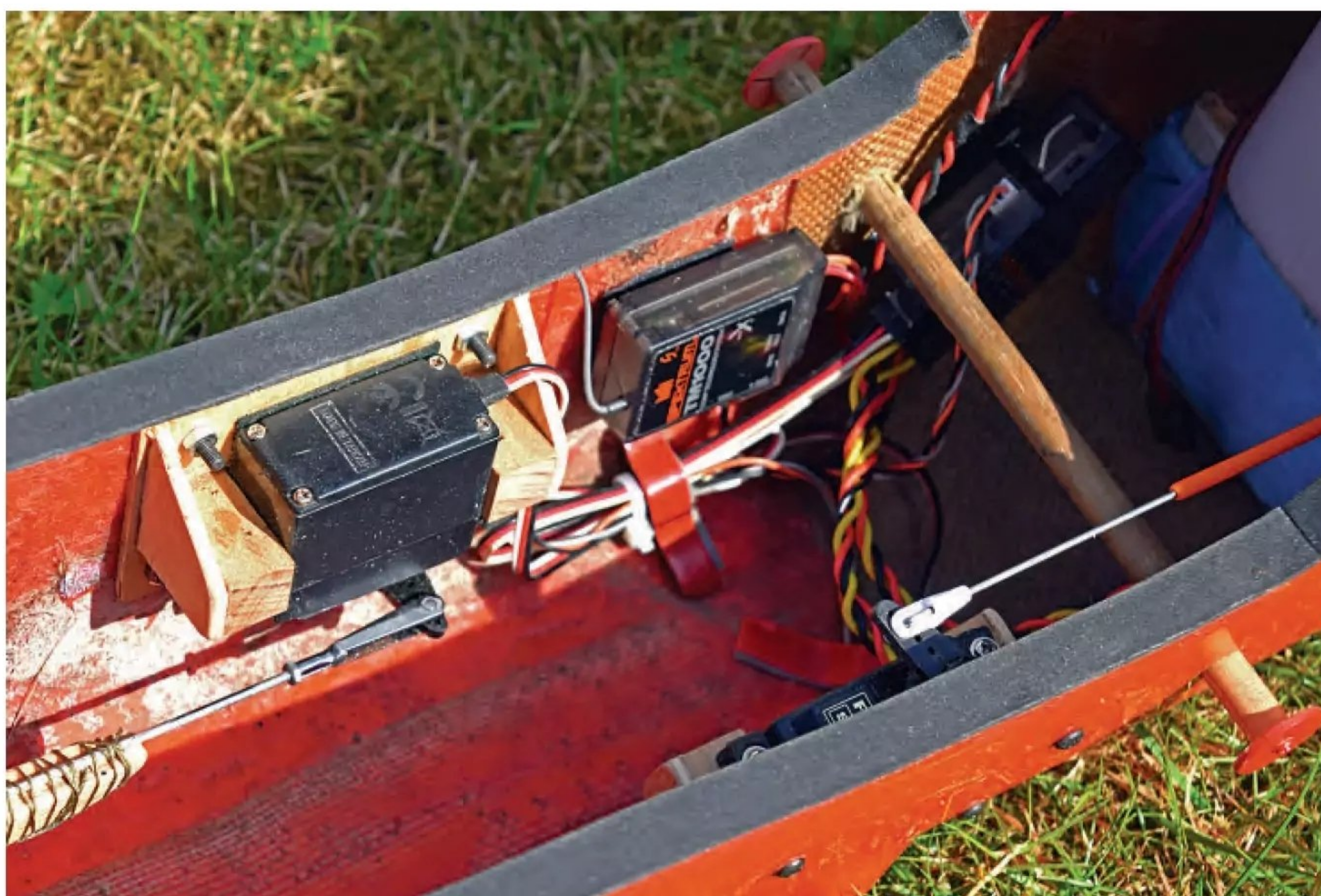
There's no problems servicing, cleaning or changing motors when they are mounted like this - and definitely no overheating issues.



This was the only other mod I made. As new wings were required, two servos were utilised for the ailerons rather than the original's single centrally mounted set-up.



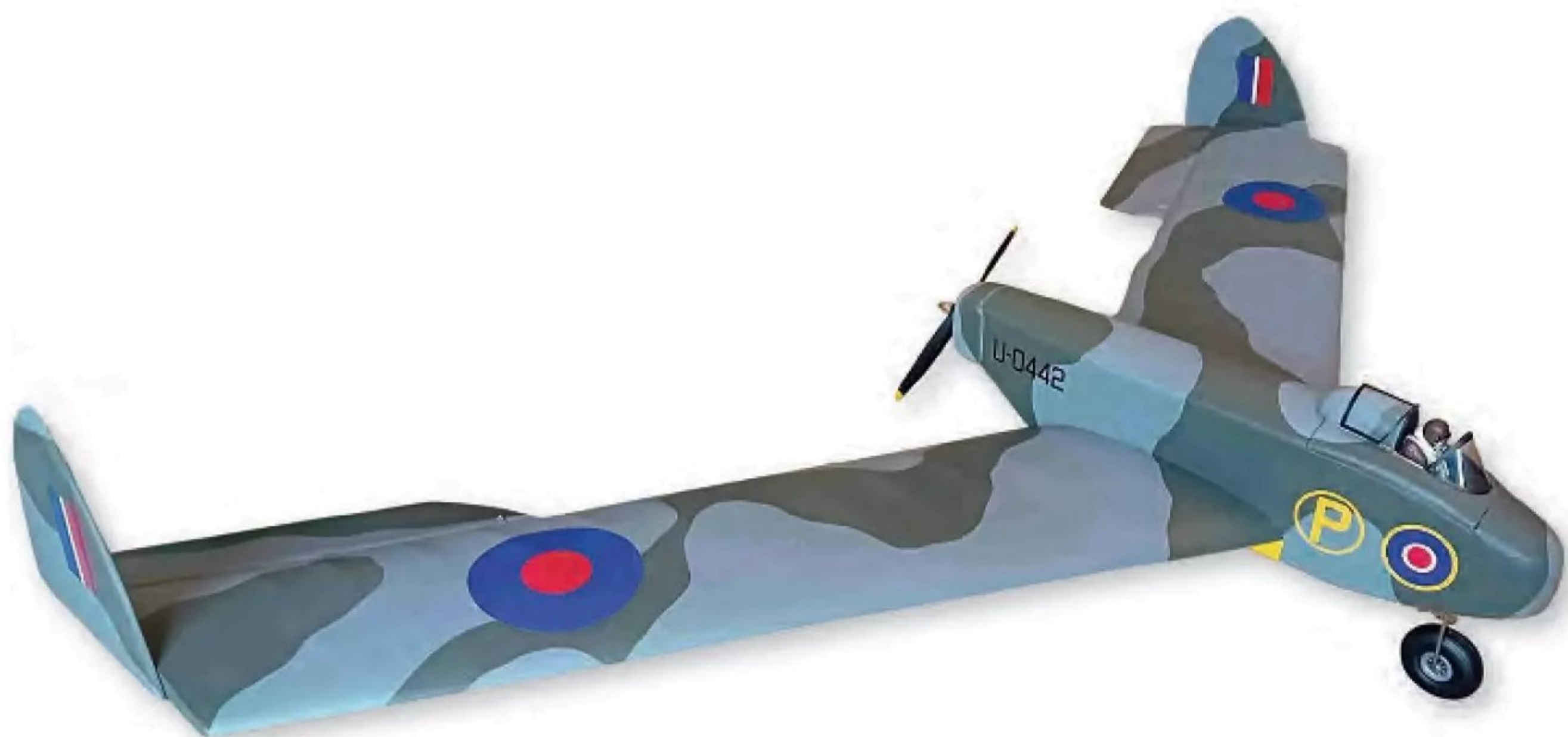
The fibreglass moulding that housed the parachute recovery system was missing on my model, so I used brown paper covered blue foam to replicate it. No need to hollow it out as I wasn't going to have that facility.



Bags of space for the radio etc. in the MATS-A's cavernous fuselage.

me with countless hours of fun and slope side shenanigans. As mentioned previously stewardship of the SAS EPP models has now been taken over by Balsa Cabin and seeing that they stocked the Venom I decided it would be a great addition to my wind powered SAS fleet. The build sequence is almost identical to the Wildthing so I won't repeat it as that was covered in my last column, the main difference being that it's swept wing and there's a little less space for the Rx. But follow the instructions and you'll have no problems, and it can be built in next to no time; I started early afternoon and was flying the next day.

The only mistake I made was covering both sides using an identical scheme. The Venom has symmetrical tip fins so it can sometimes be



It seems that my Manx Queen plan feature back in January 2023 RCM&E has inspired other modellers to build them. This example by Brian Evans looks like one of the experimental military flying wings from the mid 1940s.



Another Manx Queen by Stuart Houston has modified wing tips and a retracting undercarriage.

a tad interesting establishing which way up it is. A couple of day-glo stripes will be stuck on underneath before the next outing.

No surprises, it flew excellently, as expected. However, in a moment of madness (or was it generosity) a pal made me an offer for the

Wildthing after seeing it fly, so it now has a new owner.

SKYLEADER TARGET DRONE

I've managed to get this finished but as yet it has not flown. I chickened out of using the



This is the first time I've used this method and the results were excellent. The foam carves and sands easily (but use a mask to protect your lungs). It's a little messy slapping all the PVA on but when dried I was amazed with the strength and finish of the surface. I used 4-Max film to cover it but paint would also work well.



This final example comes from Bill Anderson who lives in Palm Desert, California. A little way to go yet, Bill.

new, un-run Merco 61 for the time being and installed a modern ASP 61 instead for testing as it has far more power than the Merco and is run in. I know we used to successfully fly models like this on older, lower powered 10 cc motors but 8 ¼ lbs seems very heavy these days.

The only changes from the original are that I've used a servo in each wing for the ailerons and covered the wings in a heat shrink covering (from 4-Max) rather than the original Fablon, the sticky backed plastic that appears to have been used on the other example that my pal Mike has. Not succumbing to Mike's suggestion to shoot a few holes in it with his mate's 22 rifle for authenticity (on the ground, not in flight just in case you were wondering!) I sourced some vinyl printed bullet holes on the web to adorn it with.

Now I just need someone to launch it for me and if I like how it flies, I'll be building a take-off dolly.

ALL DONE

By the time this you read this the Pontefract Single Channel and Retro Event will be a distant memory. But if the weather is kind, I'll be covering that next time with a plethora of classic model photos and stories from yesteryear.

Oh, and I failed again with the mystery item. Martin Bedding from the USA just emailed me with the correct answer (he gets his RCM&E mag a good few weeks later that we do here in the UK). Well done, Martin!

Don't forget, send your stories and pictures to me at: aeromodeller@gmail.com

Keep well, keep flying and I'll be back soon. ■



A basic trainer is not so basic and can teach us so much more. But, oh so often, it is passed by for something more exotic, way too soon.

EXPLORING THE ENVELOPE

The virtues of going slow are described by Lindsay Todd

Words & Photos **Lindsay Todd**

For most club flyers there is great satisfaction in smooth circuits, the odd loop and roll, and that inevitable grin and cheery disposition that comes from a 'greaser' of a landing. To take the model home in the same condition as it arrived means we have had a good day at the office. For some, however, me included, pushing the boundaries a touch adds a little more flavour to the mix and there can be great satisfaction in flying a model towards the limits of its capabilities.

Let me clarify that we are not talking about provoking crashes and tip stalls here. Rather

exploring and developing our skill set so that it allows us to determine safe working limits and fly a model to the maximum within those limits. It would be very easy to waffle on about 3D aerobatics and hovering etc. but that is flying 'outside' of the envelope, with a reliance on power and set up, not to mention airframe type and a personal level of skill. Here, we are talking about developing the building blocks to perhaps one day approach 'outside the envelope' but very much staying inside and identifying the limits, very much as a traditional test pilot would.

So, yes, in a way: how to become a Test Pilot.

SIXTH SENSE

Despite being remote from our models, we all develop, over time, a sixth sense in how the model is flying and relating to our inputs on the transmitter. On a calm day these responses are cleaner and easier to interpret which is why, when we learn to fly, we have more success when the weather conditions are favourable. As we progress, we often hear more experienced pilots saying, 'You'll learn more when it's windy.' This is a very fair comment, but we must understand why.

Windy conditions of all types will affect the way the model responds to inputs on the

“Most of us learn to fly on stable aircraft and assume these models are past their usefulness once we have the basic flight skills in place”

transmitter. This will force us to compensate and react more quickly to its characteristics. Once a basic grasp of flying techniques has been gained, flying in such conditions can rapidly build this sixth sense capability. The trick is, of course, to progress slowly and don't go from a first flight on a calm day to a 20-mph gusty day as it can kill our confidence. So, we build up slowly in recognising the conditions and move forward steadily, growing in confidence as we do so.

Once we can, again with confidence, fly in most conditions (and by this, I mean take off, land and fly simple circuits and figure eights) we can start to push in new directions to assess how our models react when flown in differing manners. Most of us learn to fly on stable aircraft, either a high wing layout or perhaps a powered glider etc. and assume these models are past their usefulness once we have the basic flight skills in place. Not true; these are excellent models for pushing boundaries and 'getting away with it'. Yes, you know what I mean!

GOING SLOW

I would class slow flying as an absolute 'must have' when developing flight skills within 



3D hover. Not truly vertical, it is reliant on thrust rather than lift and is definitely outside the envelope.



If just looking at a Spitfire does not tell you to be aware of slow speed handling and stall characteristics, then you are not ready to fly one.



See that wing, which is right on the limit or perhaps just over. We need to train ourselves to predict and react.



Don't think that gliders don't have similar traits. We don't have power so maintaining the glide path and airspeed is perhaps even more critical to learn.



The classic tip stall of a warbird on approach. Or was it a gust of wind? Come on, we all know the truth!



High wing trainers are great at flying slowly both safely and predictably so don't move on from them too soon.



High drag models such as biplanes or triplanes are classic examples of models that have sudden and often dramatic stall conditions.

the safe operating limits of any given model. Therefore, our need to develop the skills to do this should be considered as being very important. However, for many we only ever operate in this zone on the landing approach and, on occasions, take off, but that is a slightly different scenario.

Until very recently there was no 'real time telemetry'; no claxon going off in the cockpit identifying a stall warning, so the only way to know how slowly a model can fly is to find out by deliberately taking it to the point of a stall. This is too often viewed as being a risky thing; what if it won't recover; what if it goes into a spin, etc. This is why we need to develop these skills, firstly to recognise symptoms when at the limit and secondly to know how to recover without panicking.

As experience is gained simple airframe geometry can give great insight to potential characteristics that might prevail at the point of stall. We have all heard the foreboding comments about the Spitfire's elliptical wing and its potential to tip stall. I would caveat that by stating it is only a problem when flown outside of its natural flight envelope. Our aim is to develop insight to recognise when we are approaching the limit and go no further.

As a general characteristic there are simple ways to explore slow flight and the stall characteristics. First, let's state from the outset that height is our friend and all initial exploration should be done with a perceived safety height that allows for a most dramatic stall such that we have time to recognise and react without panic. Low flying stall tests always end up in a bin bag. Air speed is also our friend and combined with height allows us to regain control, often simply through allowing the sudden descent to bring the model back into a fully controlled manner again.

As a rule, a model flown at a sensible height can have the power reduced and will need progressively more elevator input to maintain height as the airspeed decreases. What is happening is that we are increasing the angle of attack to the oncoming air and, at some point, the wing stops working, we lose lift and we are in a stalled condition. At this point several things can happen, pending lots of factors, from airframe geometry to weather conditions, but in principle the control surfaces effectively have no airflow and stop working. So, at the absolute point of stall we have no control.

It is therefore the ability to recognise these traits building up to this point that we need to learn and develop some insight for. Sensitivity of elevator authority; has this become slower or even nonreactive. Is there a loss of directional control, either in roll through the ailerons or even with the rudder. All these factors will progressively decrease in their sensitivity as we approach the limit of our slow flying envelope. On a conventional sport model this decay can be quite gradual and will often require provocation to achieve a full stall. Other model types, particularly scale, can have a much more aggressive and shorter progression to this condition. So, sport models are great for learning on and scale models are where we put what we have learnt into practice. This sort of explains all those Spitfire comments!



A slow pass in nose high attitude, not on a take-off or landing.



F3A aerobatic designs have design characteristics that make spin entry and exit very controllable.



Slow low passes using throttle and elevator to just keep the airspeed above the stall are a sign of a good pilot in true control.

“A well-trimmed and set up aircraft is more likely to drop its nose rather than drop a wing and fall into an incipient spin”

IN A FLAP

Is that not why we have flaps, so we can fly slower? Well, yes, and most definitely no. Let me explain: flaps do several things but generally there are two significant factors. First, they change the shape of the wing, generally in the centre region, changing the camber and angle of attack to the oncoming air and therefore provide more lift. They also create drag and so we can typically achieve a steeper and slower landing approach and indeed slower, lower passes. But drag also means we probably have a more aggressive stall when it does occur, so we need to be aware of this. Drag on biplanes etc. is a cause of many issues and they need careful and consistent monitoring of power to sustain controlled slow flight.

IN A SPIN

The spin is an aerobatic manoeuvre and there are many variations. A well-trimmed and set up aircraft is more likely to drop its nose rather than drop a wing and fall into an incipient 



Slow flying skills come to the fore when flying a scale model off water.



Flaps create lift and drag and need to be balanced with the power setting to avoid things getting a bit nasty.

spin. An incipient spin is the initial stall and rotation, often taking multiple turns, but is not considered as a fully developed spin and, as such, recovery is normally straightforward enough by simply regaining airspeed through rate of descent and sometimes application of rudder in the opposite direction of rotation.

Once in a straight dive models can be recovered to normal flight in the usual way.

Panic, however, with sharp and full application of elevator and other surfaces can elicit a fully developed spin, whereas opposite elevator and rudder may be required, plus greater height loss in the process. These are not

things to fear but to be aware of and therefore you need to be primed with the solutions to put in place.

Every model has slightly differing characteristics and it's why, specifically, that F3A aerobatic designs encompass design characteristics that make spin entry and exit very controllable and precise. Some scale models can be more unpredictable and can take time to assess the limits of safe practice.

BECOME A BETTER PILOT

Once mastered flying just above the stall is really good fun and great for developing technique. The rudder will become much more of a friend and not something used just for take-off and taxiing, as some models can be flown in a nose high attitude (high alpha) and steered on power and rudder alone, using opposite aileron to keep the wings level and power to maintain that safe airspeed. It takes time to develop but it really improves your general flying ability and your aerodynamic knowledge in how things work on a practical level. Once this becomes second nature then performing slow fly-bys become the norm, touch and goes will be effortless and every landing near perfection. Okay, that's a gross exaggeration, but it is these very skills that allow you to jump from one model type to another with comfort. Recognise characteristics and develop the ability to quantify and stretch the flight envelope without crashing and ultimately you will become a better pilot. No, make that a test pilot! ■



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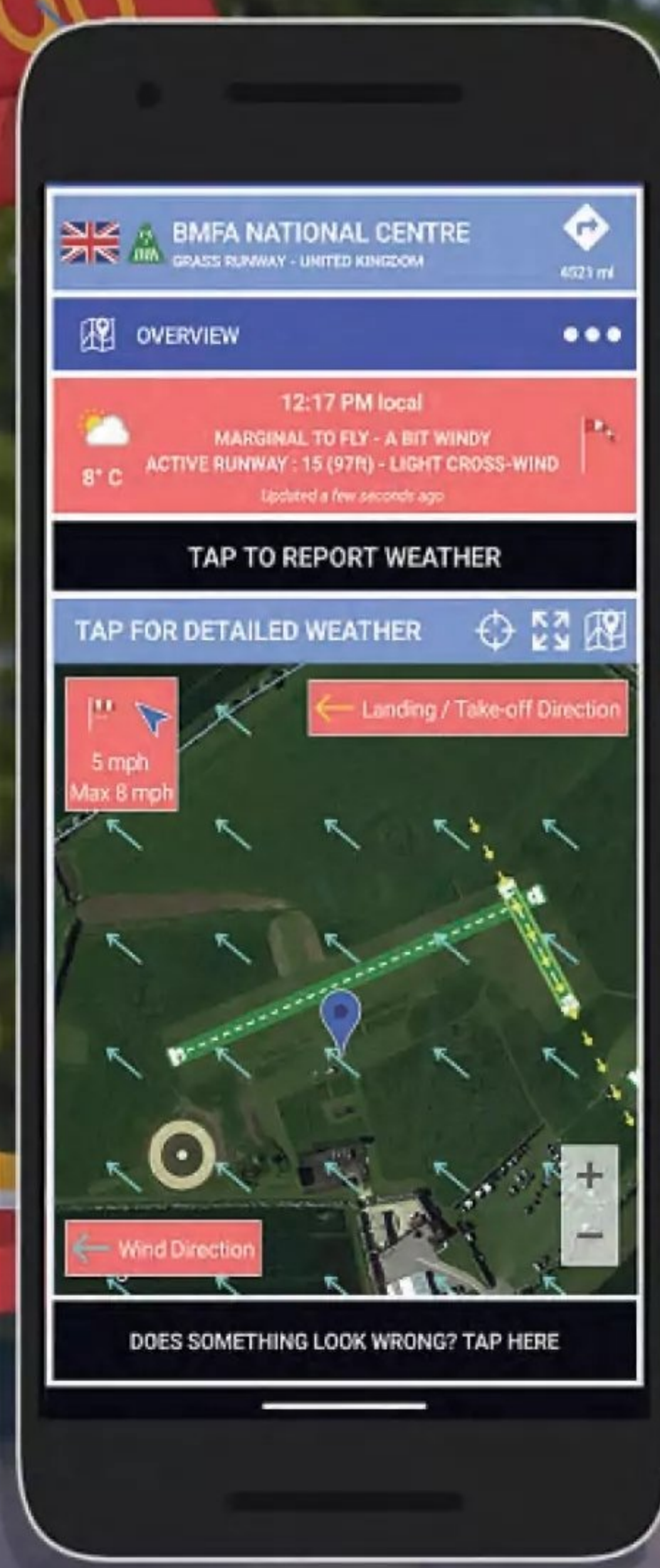


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The author's Union Jack Hawk flying over the sea, taken at the Great Orme by Phil Cooke.

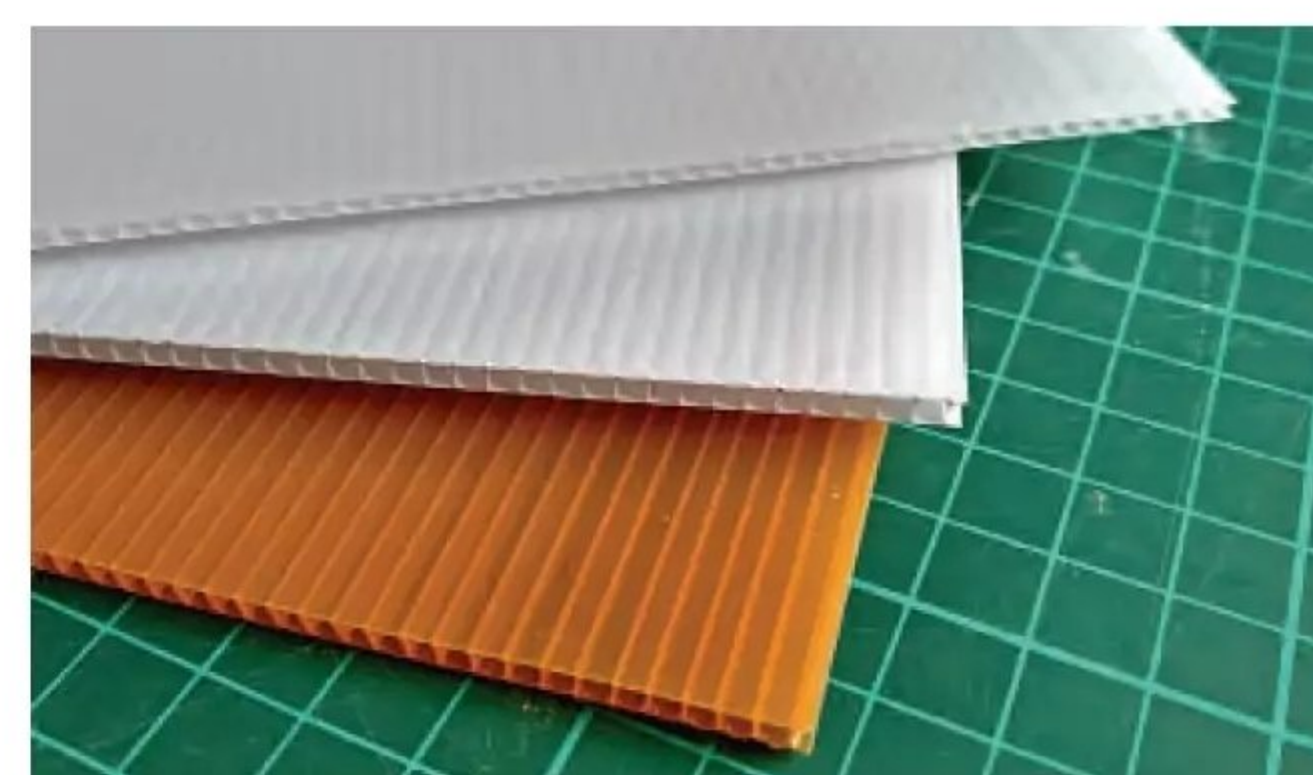
BUILDING WITH CORREX

Phil Stone shows how to make a PSS Hawk T1 using fluted polypropylene sheet

Words & Photos: **Phil Stone**

The Hawk T1 is an aircraft that needs little or no introduction. At the very least we're all more than familiar with it as used by the RAF Red Arrows display team. Being a trainer, it lends itself as an ideal subject for building and flying as a PSS (Power Scale Soarer) model. I first started building in Correx in late 2018 and have since built countless models, five of which have been Hawks, my most recent being the Union Jack covered 2010 version you see here.

There is a plethora of powered models out there which could readily be stripped out and converted to PSS, as well as balsa kits, but for anyone looking to get into PSS on a budget then building an aircraft in Correx may well be the answer. Correx (also known as Coroplast in the States) has been around for quite some time now, but for anyone not familiar then you would most likely recognise it as being used for housing 'For Sale' signs and floor protection within the building industry. It is a twin-walled, fluted, polypropylene sheet and is available in



Correx sheet is available in different colours and thicknesses.



Phil Stone with his Union Jack Hawk and Correx Super Corsair, captured during a PSSA event on the Great Orme by Phi Cooke.



Next time Phil shows how to build the T1's fuselage. Suitably primed, Correx can be painted to a high standard, as Phil's 'Red Arrows' Hawk shows.

“Building in Correx is relatively quick when compared to more traditional balsa construction methods”

an array of thicknesses from 2 mm upwards, generally in white but also black and a range of other colours too.

Building in Correx is relatively quick when compared to more traditional balsa construction methods, usually taking me around 3-4 weeks to have something ready for painting. So, if you fancy building a Correx PSS Hawk for yourself then please read on...

CORREX PLANS

There is a good selection of free plans available as PDF files to download from RCGroups.com. Most of them date back to around 2011 so are not that easy to find now, but if you perform an 'Advanced Search' for 'Correx-PSS' in 'Titles Only' you will find the build log by 'Flying Beagle' - all 253 pages of it! Virtually all the plans are listed on page 1. Sadly, though, the excellent build videos for a Spitfire that were also there have since disappeared, but there's still a wealth of photos and other peoples' builds to read about. Of the plans listed I have built the MiG-7, Corsair, Hawk, L39, Pilatus PC-7, Spitfire, A10 Warthog and, most recently, the MB-326 Impala. Some builds are easier and fly better than others. For anyone building in Correx for the first time then I would highly recommend the MiG, followed by the Hawk. Both fly well but the MiG is the slightly easier build.

The plans are generally A0 in size and normally just two sheets. There are printing services available online but if you can find a printer local to you then it saves on postage. If you can't find anyone local then, in the past, I have been very pleased with the service offered by Netprinter.co.uk. It's handy to have a second set of prints for reference because you'll be cutting the first set up to use as templates.

When building the Hawk in particular, you should first be aware that there are two versions of the plans, both produced by Trevor Stroud in South Africa. Version 1 can be found, along with plans for all the other aircraft, on page 1 of the aforementioned build log. But Trevor ultimately wasn't happy with the resultant model's flight characteristics so he drew up a Version 2 set of plans. These can be found once again by performing an 'Advanced Search', this time by searching for User Name: 'TrevorJS' and keywords: 'BAE Hawk Slope Soarer'. The Version 2 wing has a reduced amount of sweep, resulting in a straight but less scale-like trailing edge. The wing spar is also straight rather than previously swept and with a reduced depth and reversed wing tip taper. The fuselage construction and everything else remains as Version 1.

For a first-time builder I would recommend building Version 2, although having said that I have always built something of a hybrid of the two, using a straight trailing edge but still maintaining a swept spar. More on that when we get into the build itself.

SOURCING CORREX

Correx is comparatively cheap compared to balsa. The caveat to that is you may well have to purchase considerably more than you'll require for just one build. Typical Correx PSS builds use 2 mm thickness for the wings and 3 mm for the fuselage, tail surfaces and ailerons. Sourcing the Correx, particularly the 3 mm thickness can be tricky. Ideally you need to find somewhere local to you where you can buy it directly and get it in a sheet size small enough to fit in your car. If you have it delivered then that can be costly. Plus, you also need to be sure it will be delivered flat and NOT rolled. Another thing to be mindful of is flute direction, which is critical; you may find a suitable sheet size, only to then find that the flutes are running the wrong way!

In the past I have had 2 mm Correx delivered from:

Kitepackaging.co.uk – 2 mm thickness, 1150 mm x 950 mm corrugated plastic sheets and layer pads (min. order 10 sheets).

For 3 mm Correx I use a company local to me that provides materials to schools and colleges:

KM-Wholesalesuppliers.co.uk – 3 mm thickness, 1220 mm x 610 mm Correx (min. order 10 sheets).

For many of my builds I have also used 2.5 mm floor protection sheets for the wings in lieu of the 2 mm, but I had to order five 8 x 4 sheets in order to do so:

Theplasticshop.co.uk – 2.5 mm thickness floor protection sheets, 2440 mm x 1220 mm (min. order 5 sheets). It's a little heavier than the 2 mm but a little stronger too.

WORKING WITH CORREX

The flutes within Correx are much like the grain within wood; stronger in one direction than the other so flute direction within any build is critical. Compound curves with Correx aren't possible so invariably other materials become necessary e.g. balsa or foam for the nose and side air intakes of the Hawk jet. The rigidity is very much dependent on material thickness; 2 mm will bend and crease with relative ease whereas 3 mm and upwards is naturally much stronger.

Correx can be formed along its length by cutting through one wall, a process known as de-fluting. Usually, de-fluting every other flute is sufficient and helps maintain a degree of strength, but sometimes de-fluting every flute can help around the more awkward shapes. If needs be the strength can be reinstated to some extent by subsequently applying heavy duty tape over the cut surface. (Image 1 & 2)

A hooked carpet blade is ideal for the de-fluting process, but better still are two hooked blades spaced apart by around 0.75 mm (a margarine lid worked for me). Rather than just a simple cut this two-blade process then removes a slither of the wall and allows the Correx to be formed more easily without the cut edges interfering with each other. (Image 3 & 4)

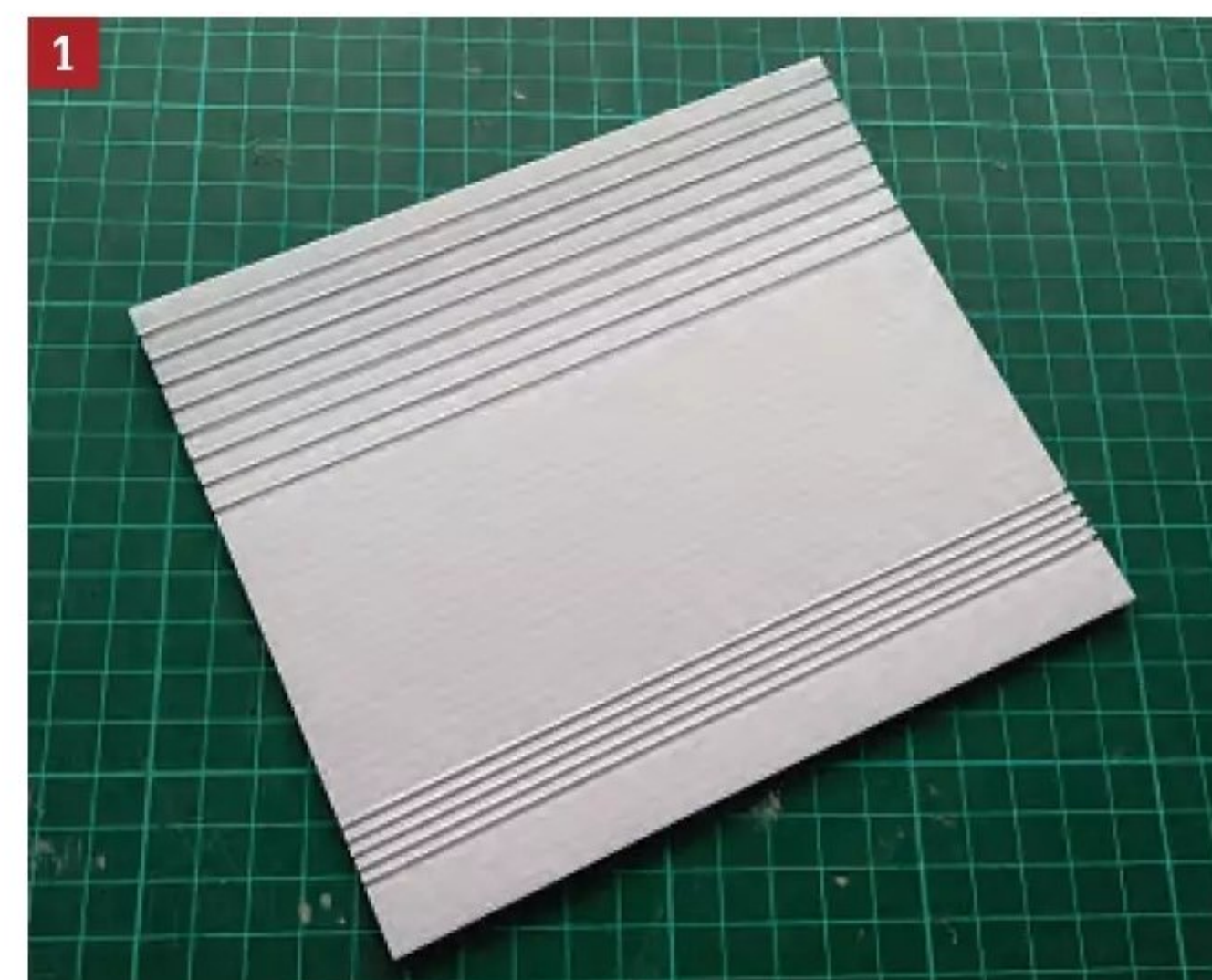
When cutting Correx always use a sharp blade and ensure you have a good supply of spares. This is particularly important when cutting items like the ailerons where you will need to cut at a slight angle to the flute channels. A blunt blade will tend to follow a flute channel rather than your steel rule.

Correx must be prepped prior to bonding by light sanding and degreasing with nail varnish remover or acetone. Bonding is best done with hot melt glue wherever possible and Evo Stik everywhere else, and when you need a longer setting time.

TOOLS AND MATERIALS

If you're a model builder already then you'll probably already have most of what you'll need:

- Scissors
- Fine tip permanent marker pens
- Scalpel with plenty of spare blades
- Long and short steel rules / straight edges
- Cutting mat(s)
- Saw (jig saw / band saw / scroll saw – any will do)



“...on more than one occasion I have gone ‘off-piste’ from the plan’s original intent and added extra scale detail along the way”

- Drill
- Hooked carpet blades
- Hot glue gun and a copious supply of glue sticks
- Assortment of clamps
- Hot air gun
- Evo Stik
- Nail varnish remover / acetone
- Methylated spirit

Other items like a Dremel and disc sander come in handy but are not essential.

THE HAWK BUILD

Before we get into the Hawk build itself (using the Version 2 plans), I should first of all say that in all of my own personal builds I have continually strived to improve the build methods, taking on board other people’s ideas as well as introducing some of my own. I have also aimed more and more for a scale-like appearance, so on more than one occasion I have gone somewhat ‘off-piste’ from the plan’s original intent and added extra scale detail along the way. I will explain these changes as we progress through the build. You can choose to do something similar or stick to the plan and keep it simple – the choice is yours.

For clarity I have occasionally used photos from some of my other Correx model builds too, so please keep that in mind if you ever think, ‘Hold on a minute, why’s my Hawk not looking like that?’

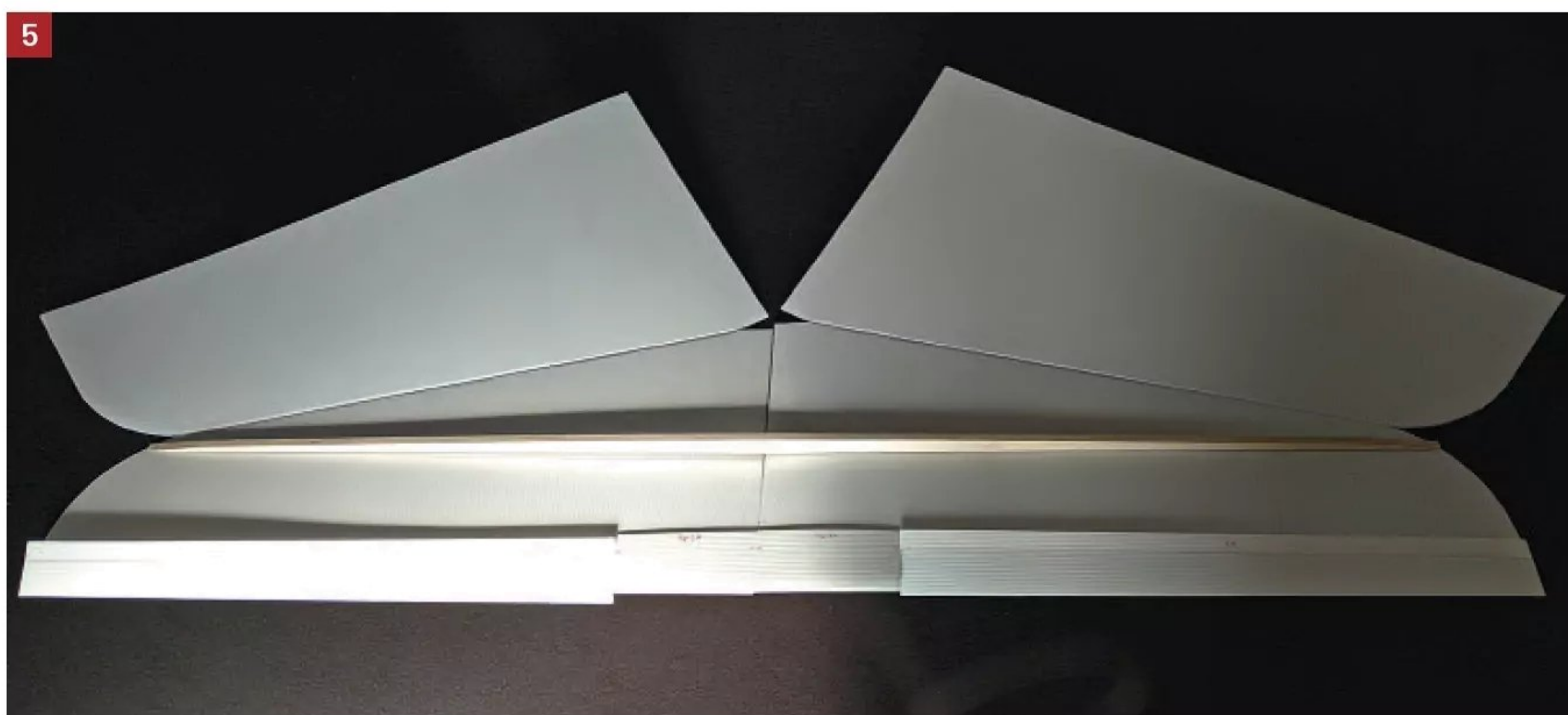
THE WING

With any Correx build I would recommend starting with the wing because ultimately you will need to size the fuselage to suit it.

First of all, mark out the spar using the paper template, then cut the spar... And straight away this is something I have done differently so I will try to explain why:

The design intent, for simplicity, has a totally straight full-span wing spar, the upper surface of the spar being horizontal and the lower surface tapering upwards towards each wingtip, providing a small amount of dihedral in the process. If you study the plan, you will see that this straight spar sits at around 50% chord at the wing root and just 10% chord at the wing tip and as a result doesn’t produce a particularly nice aerofoil shape. (Image 5)

If you ultimately decide to build this straight spar, then pay particular attention to the wingtip ‘chamfer’ which tapers from 5 mm thickness down to zero over a 50 mm length. This chamfer on the Version 2 plans removes material from the upper surface of the spar, whereas on Version 1 and every other Correx model type I have built this chamfer has always removed material from

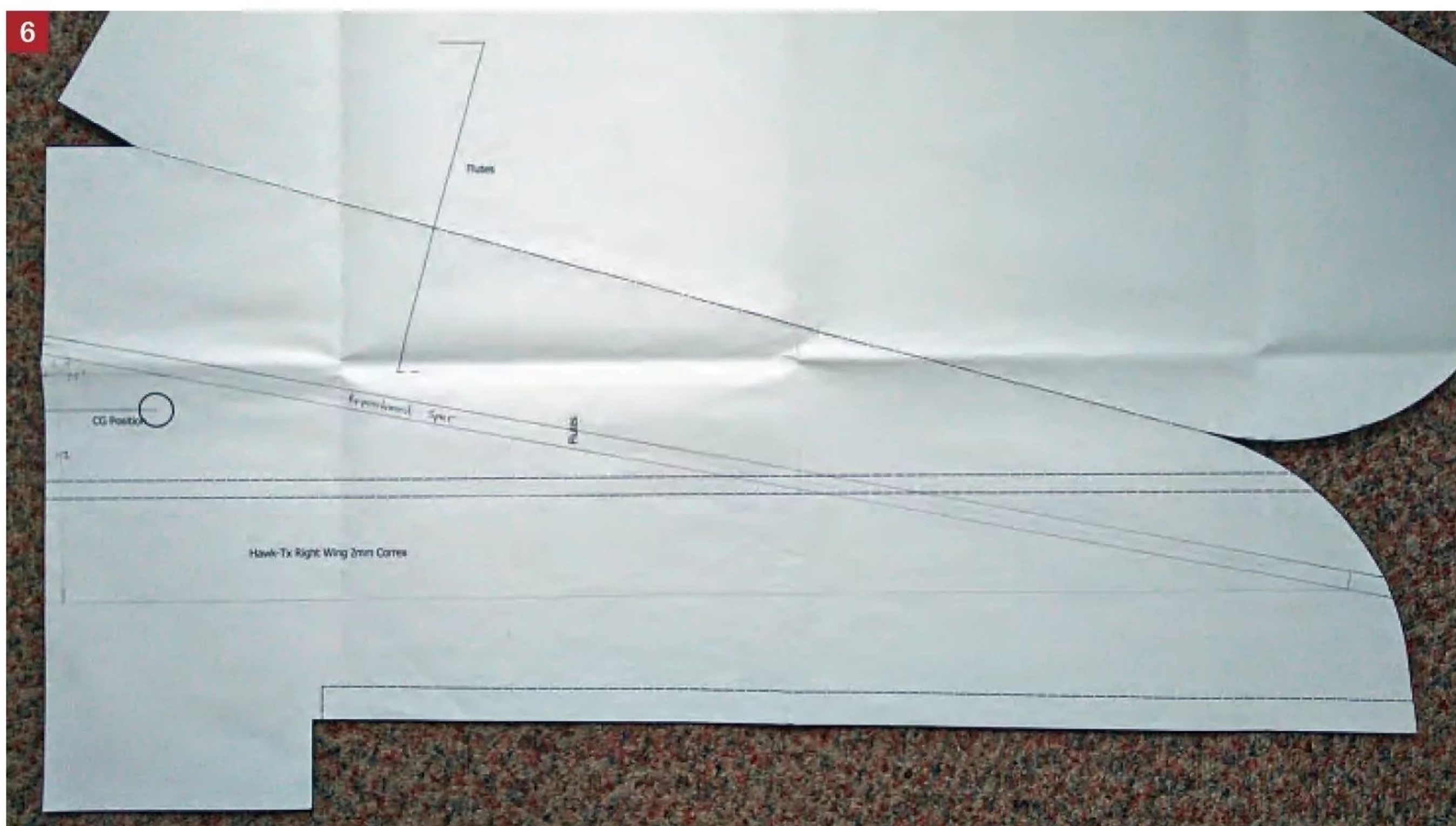


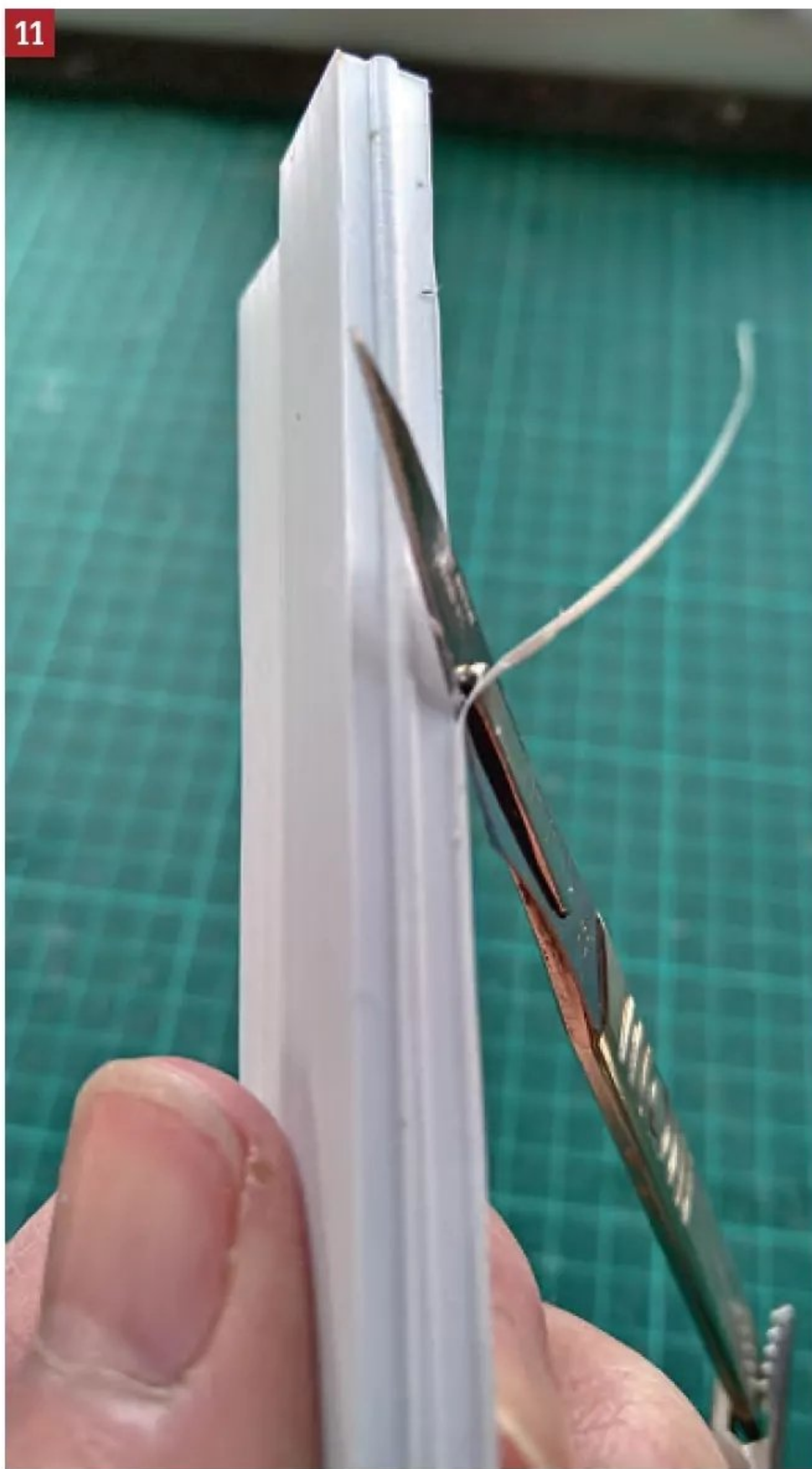
the lower surface, which helps to introduce a degree of washout at the wingtip.

My spar method requires a little more work but ultimately produces a more regular aerofoil shape. I have introduced an 11-degree sweep into the spar, meaning it now requires to be made in two pieces. This sweep means the spar is now positioned at around one third chord distance along the entire span. (Image 6)

I have increased the spar length from 576 mm to 600 mm in the process and reverted back to the traditional lower side chamfer at each wing tip. I tend to use 9 mm birch ply for my wing spars. If you are looking to save weight then 6 mm birch ply would almost certainly suffice.

Since the finished upper spar surface on this build is fully flat and horizontal the two pieces can be glued together flat on your work





on the plan. Draw around the template using a fine tip permanent marker and mark on the spar position too. Any markings can ultimately be removed using methylated spirit. (Image 9)

Turn the template over and repeat the process for the LH wing, then cut out both wings.

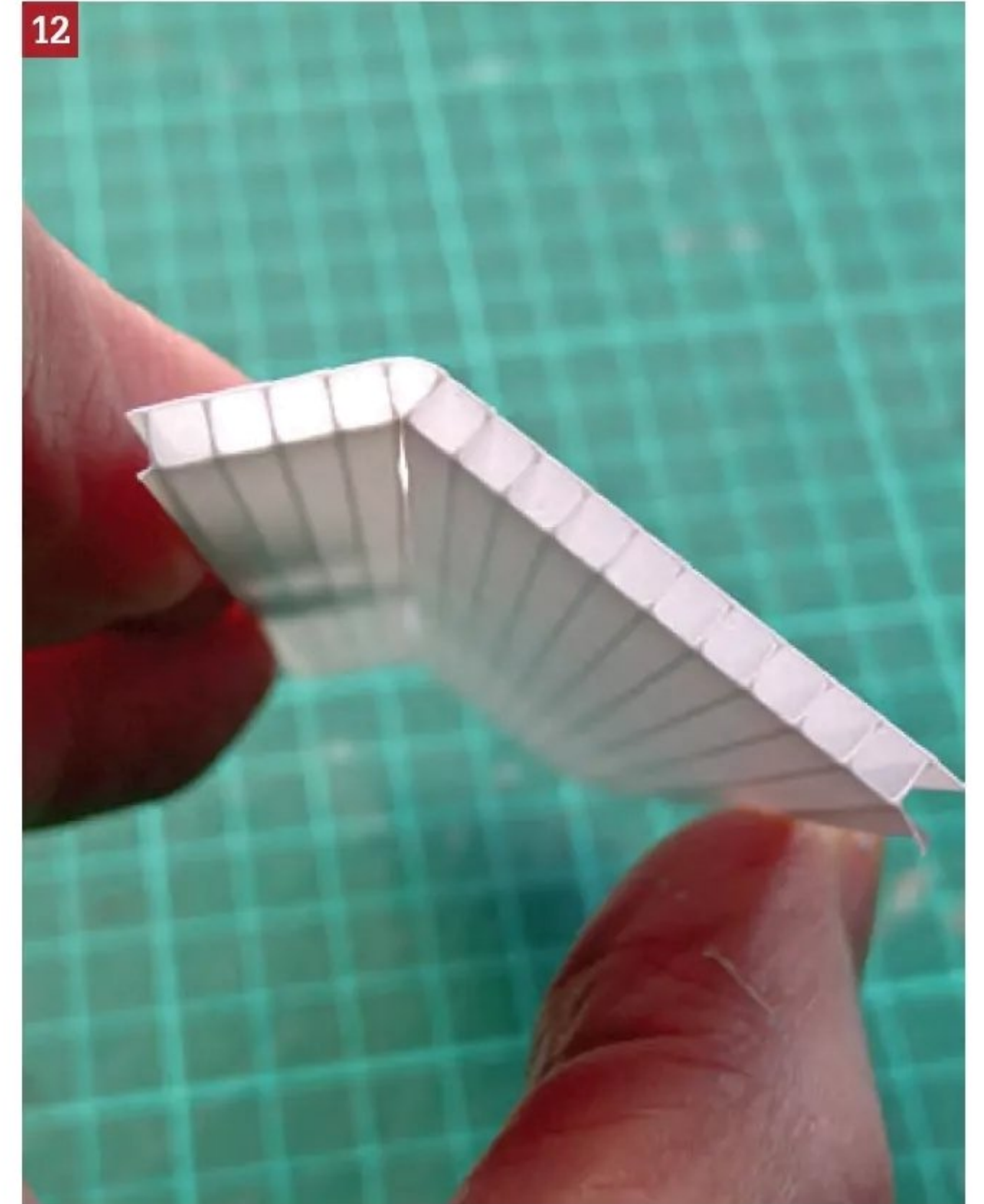
Now cut out the paper template for the RH aileron and place it on to some 3 mm Correx sheet. This time you need to ensure a flute channel aligns perfectly with the dotted line shown on the template since this channel will form the aileron hinge. Draw around the template and mark the hinge line.

As with the wing turn the template over and repeat the process for the LH aileron, then cut both ailerons out. The aileron hinge is formed by de-fluting the lower side skin along one flute channel. (Image 10)

By folding the newly formed hinge fully back on itself it is then possible to carefully cut away any remaining overhanging edges. (Image 11)

Once done this will then allow a good 45 degrees of downward aileron movement and as much upward movement as you would like! (Image 12)

Something not shown on the plan is that you will now need to cut an additional make-up piece of 3 mm Correx to fit between the two ailerons and ensure that one of its flute channels aligns perfectly with each aileron's hinge since this channel will eventually locate the aileron torque rods. Bond the ailerons and make-up piece to the wings using Evo



Stik, ensuring all joint surfaces are keyed and thoroughly cleaned with nail varnish remover beforehand. (Note that the wing spar is not glued in place in this photo). (Image 13)

Prep the Correx and then hot glue the wing spar in place. You only get one chance at this so make sure you are fully happy with its fit and location first. Run a bead of hot melt glue along just one wing surface and then swiftly press the spar in place. If you are building my swept spar version with the wing tip chamfer on the



bench with the spars inverted. I introduce the 11-degree sweep on each side by adding a joining piece of 9 mm ply sanded to the required angles and then bonding the three pieces together. Clamps and a suitable weight help at this stage. (Image 7)

I then glue and screw an aluminium cover plate to the other side for added strength. (Image 8)

Carefully cut out the paper RH wing template and place it on to the 2 mm (or 2.5 mm) Correx sheet, ensuring that the leading edge fold line is perfectly square to the flute direction as shown

underside, then don't try to glue the chamfered area at this point; that can be done separately afterwards. Repeat the process for the other wing and then, using some Correx offcuts, make a couple of wing-joining pieces and bond them in place using hot melt glue or Evo Stik. **(Image 14)**

I should say at this point that it is actually possible to unstick hot melt glue using nail varnish remover. I found this out one day when I spilt some of it inside a fuselage! So, if something does go disastrously wrong do not despair. A few repeated brush applications

of remover will eventually break the bond between the glue and Correx or ply.

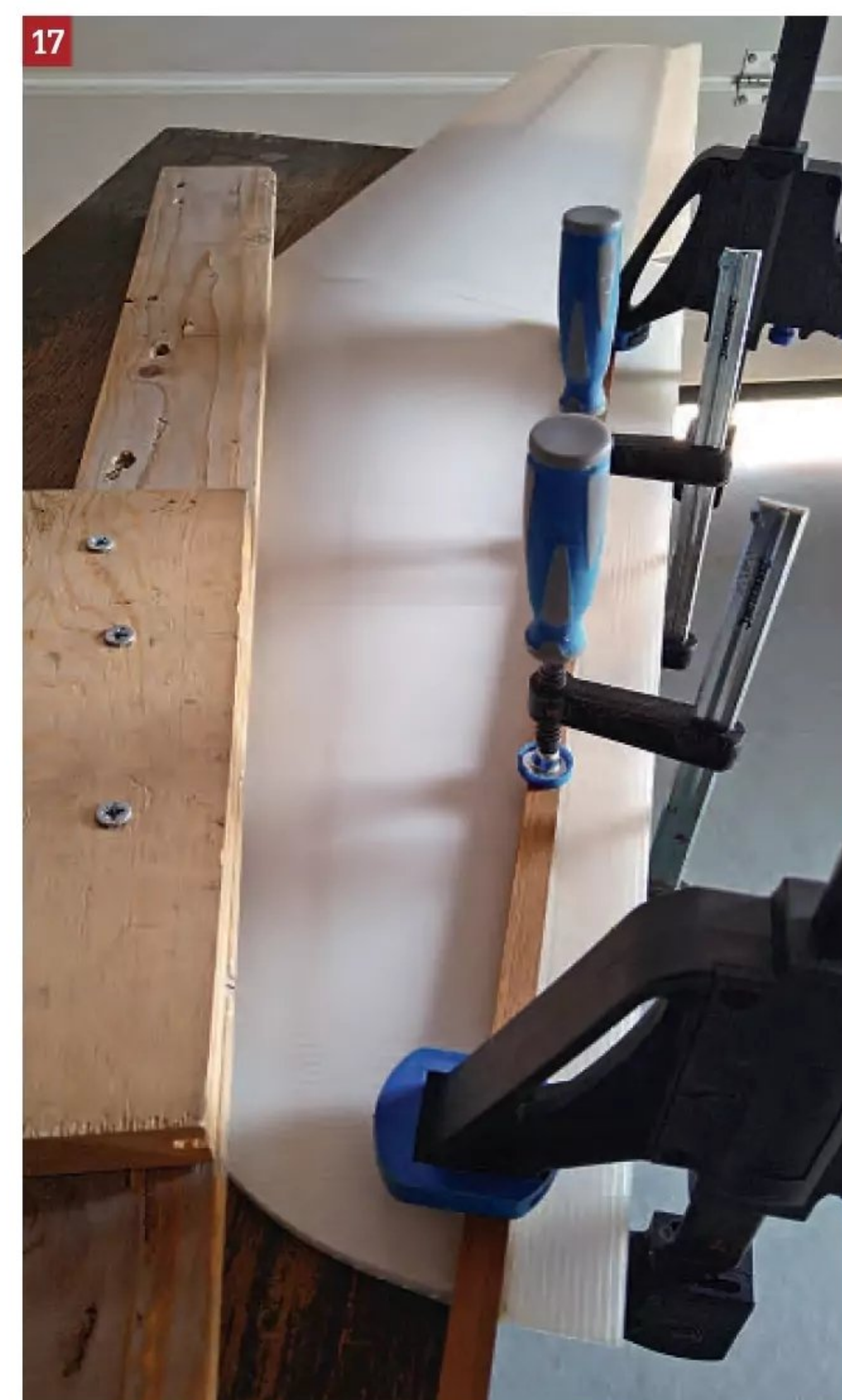
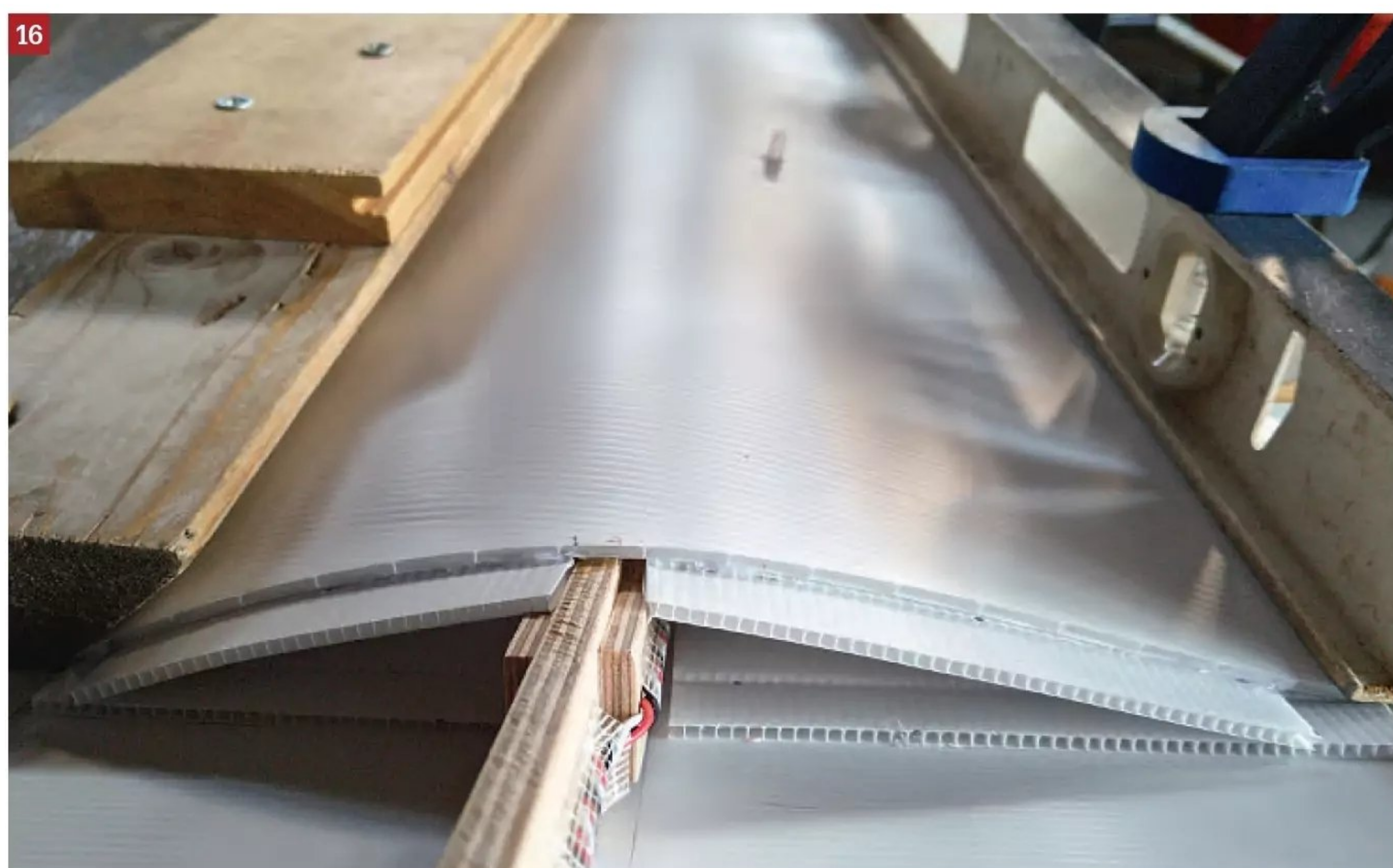
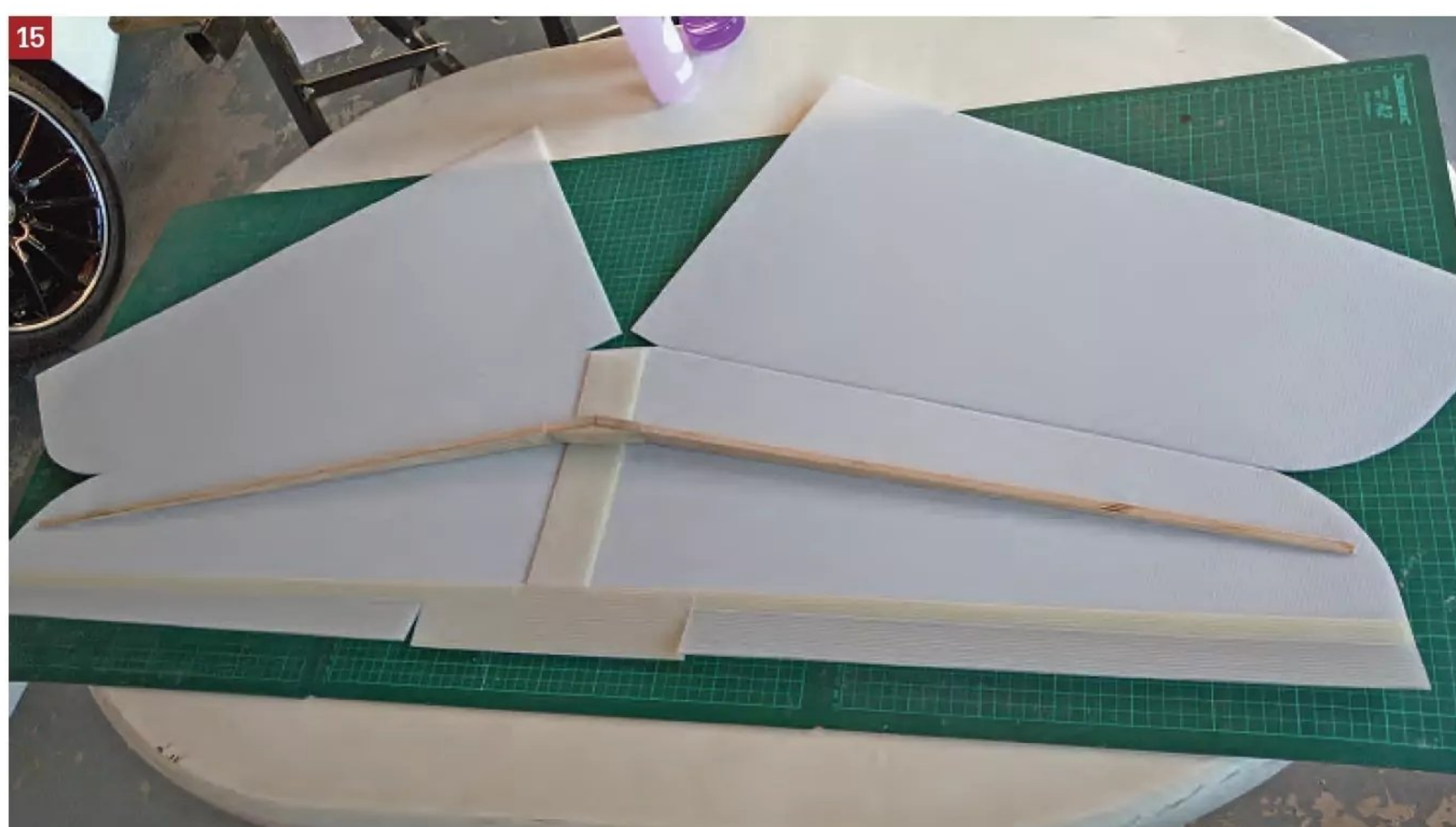
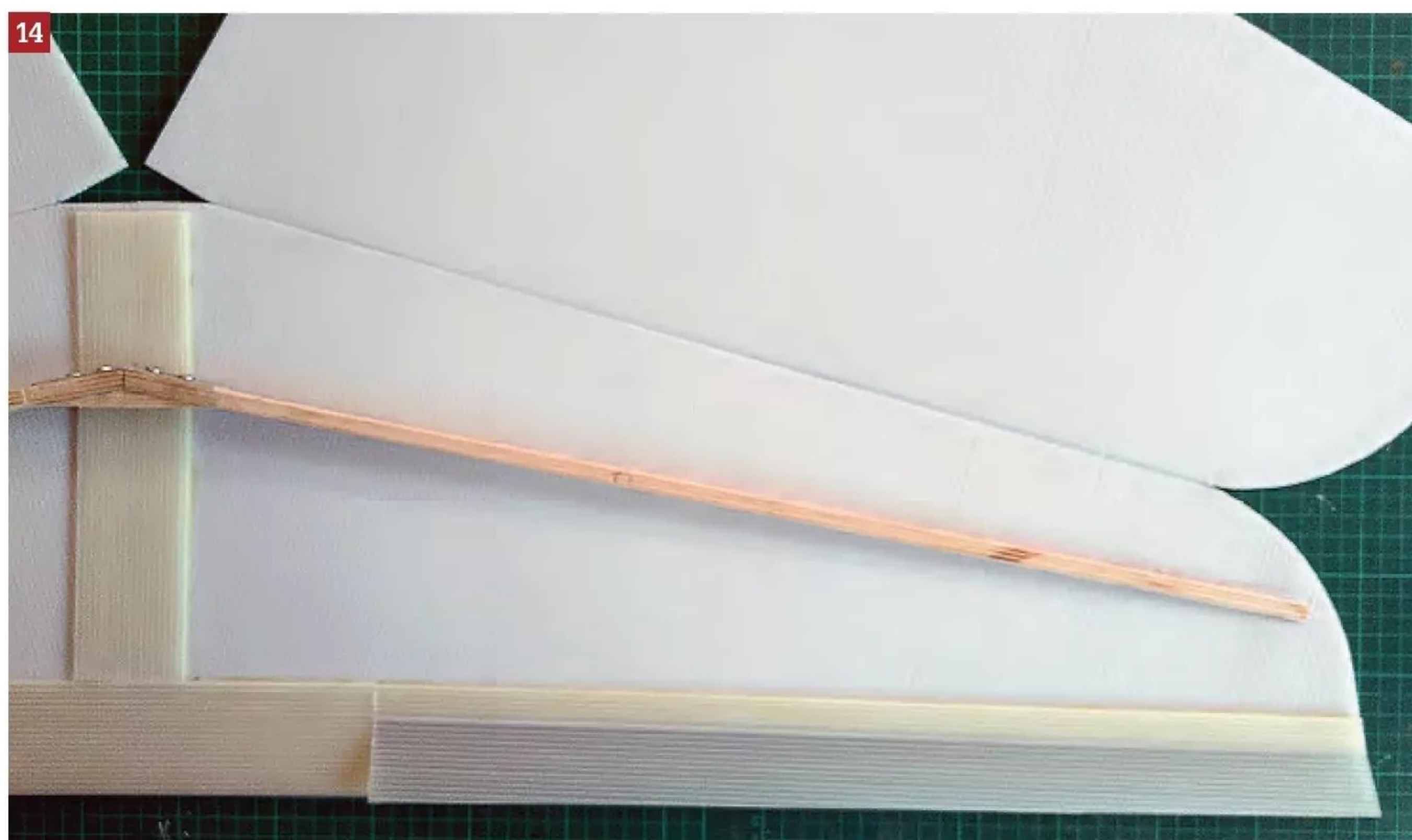
Using a straight edge and a blunt tool (I use the handle of my scalpel) carefully score along the leading edge fold line of each wing-half, crushing the flutes of the inner skins. You should then be able to carefully fold each wing-half back to create the wings upper surface. **(Image 15)**

The upper surface of each wing-half has an allowance for trimming to suit the lower surface, so you now have to fold the wing-half and gently apply pressure to hold it in place whilst you mark where to cut the trailing edge and aileron cut out. Once happy unfold the wing-half again and cut the excess Correx away. Do the same for the other wing-half and then you'll be ready to glue the wings closed.

CONTROLLING THE AILERONS

Before closing the wings, you need to decide how you wish to control the ailerons. The Hawk plans don't provide any details on this. You can either build the servos into each wing at this stage, fully enclosing them, with a slot through the upper surface for the servo arm to protrude, or my preferred method, wherever possible, is by the use of torque rods. Using torque rods means there are no visible linkages and the servos remain accessible should they ever need replacing. If you decide to use the torque rod method then carry on with gluing the wings closed.

It's also a great help at this stage if you are able to make yourself a suitable wing folding jig. The jig comprises a flat board (a piece of work top or the like) on which to place the wing, plus a length of wood with a bevelled edge. The length of wood is screwed down to the board such that each wing-half's leading edge can be wedged in place, keeping the lower surface of the wing flat to the board and also with the length of wood set at an angle such that when





in its wedged position the trailing edge of the wing runs parallel with the edge of the board. Hopefully these two photos should clarify things. Note that one photo is from a different wing build. (**Image 16 & 17**)

Prep all the bonding surfaces as before and then apply a coating of Evo Stik along the top surfaces of the wing spar, aileron hinge and make-up piece, then do the same on the mating faces of the upper wing-half. Fold the wing-

half over, wedging the leading edge into the bevelled edge of the jig, then using a straight edge and clamps trap the trailing edge closed. Apply sufficient pressure to keep the joint closed but be careful not to overtighten the clamps and crush the Correx flutes. Leave to dry overnight. (**Image 18**)

Whilst drying you can take the opportunity to cut two pieces of scrap Correx and glue them inside each wing-half at the wing root joint,



“Apply sufficient pressure to keep the joint closed but be careful not to overtighten the clamps and crush the Correx flutes”

ready to support the other wing-half when that is folded. (**Image 19**)

Unclamp the first wing-half then reposition the bevelled edge piece of wood and bond the other wing-half in a similar fashion to before, but this time also adding Evo Stik along the wing root joint pieces. Once again, leave to dry overnight. (**Image 20**)

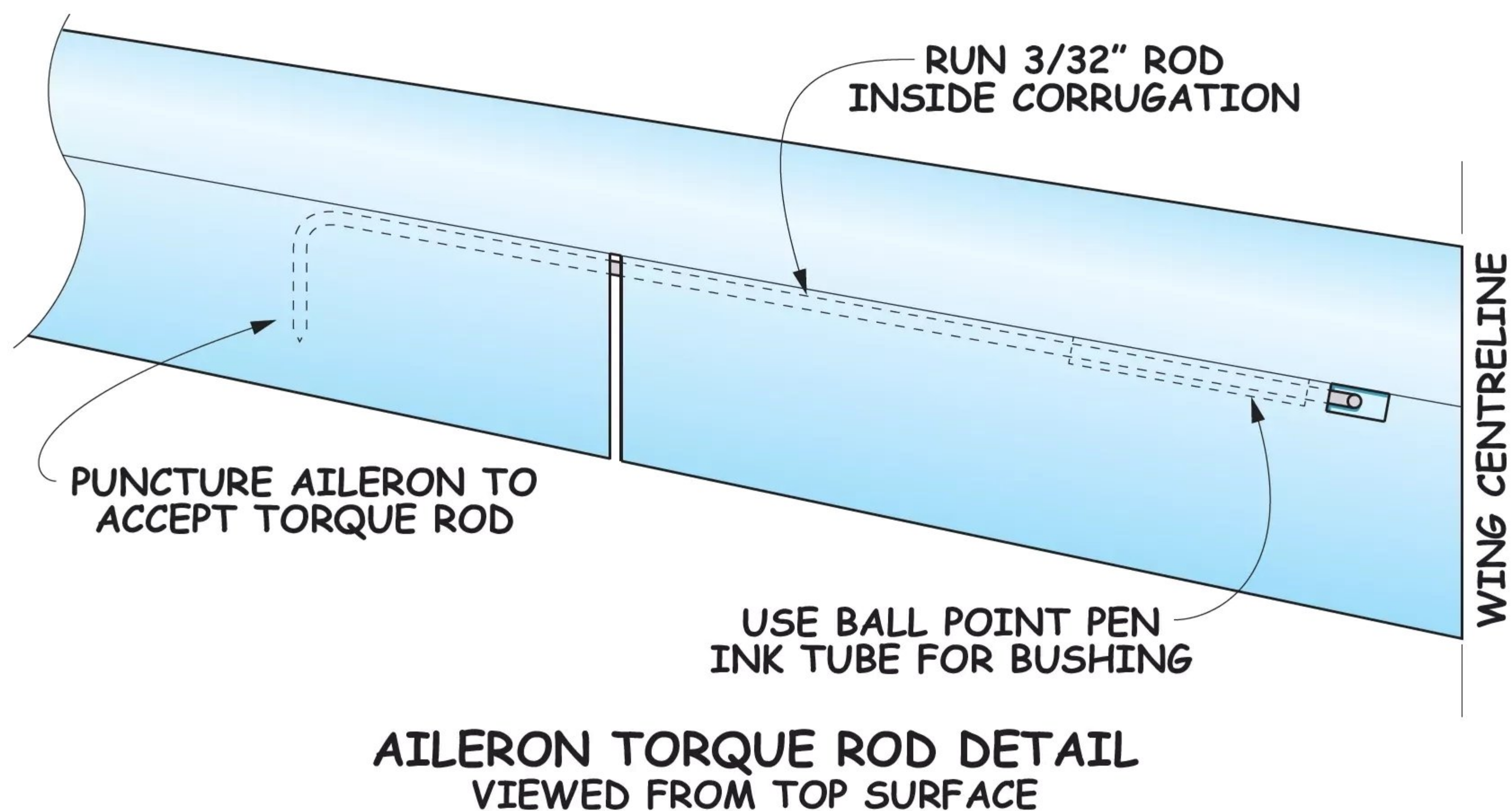
Unclamp the wing and squirt hot melt glue into the wing tip openings and gently squeeze them closed until set. Do the same for the small opening remaining at the very front of the wing.

SERVOS & TORQUE RODS

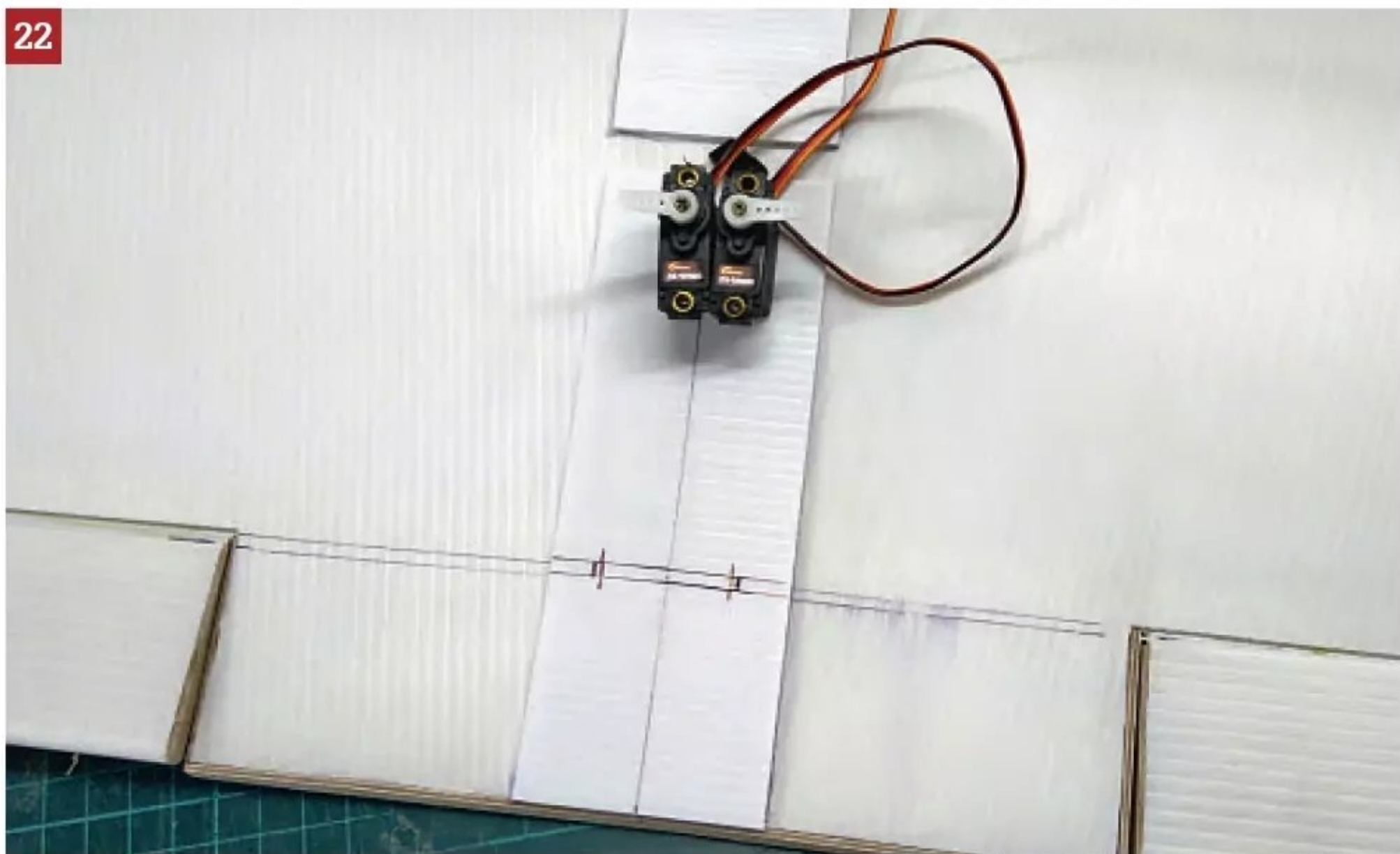
Congratulations! You now have a Hawk wing.

All that's required now is the installation of the aileron servos and their torque rods. If you take a look at the plans for the MiG, you ➔

21



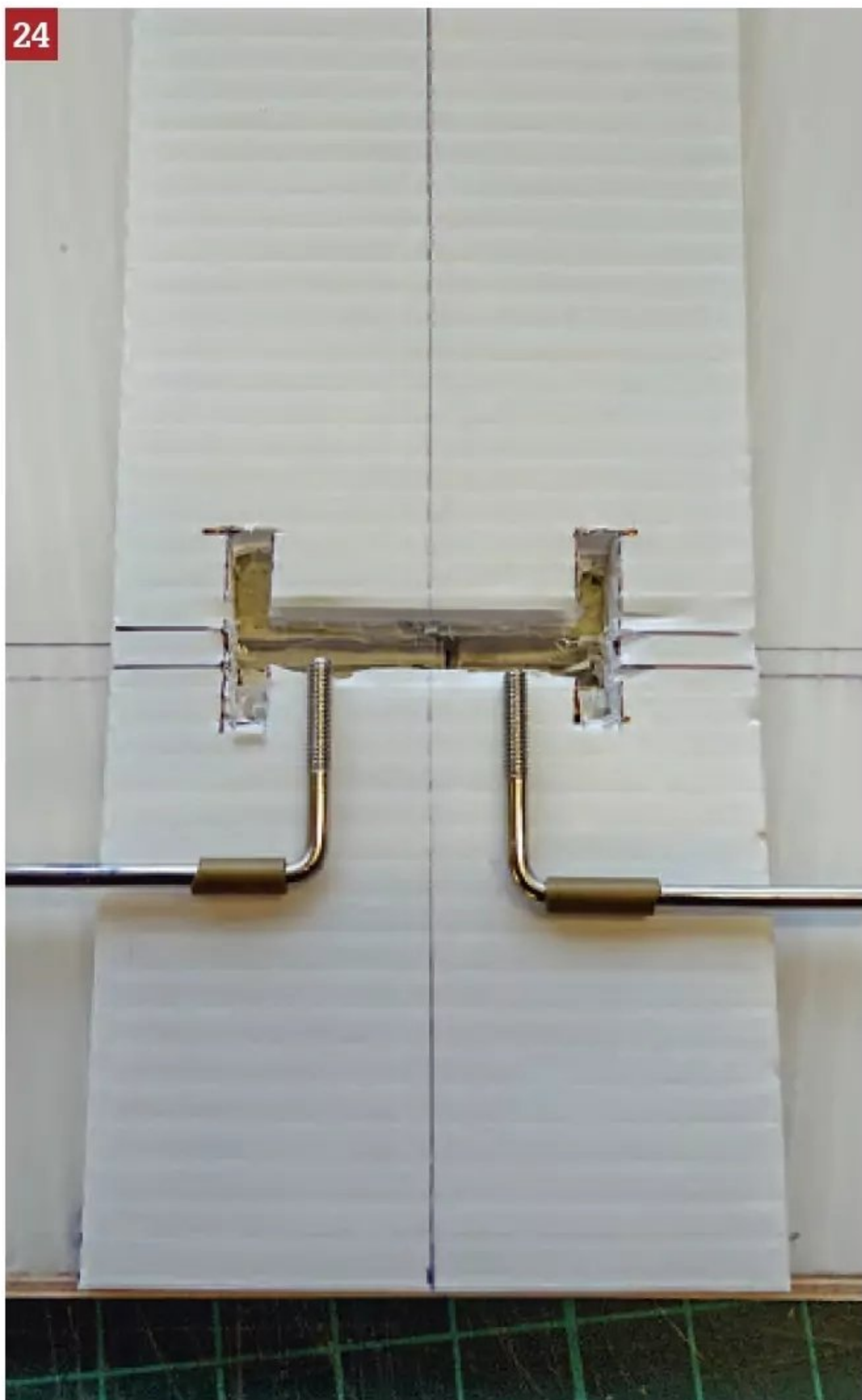
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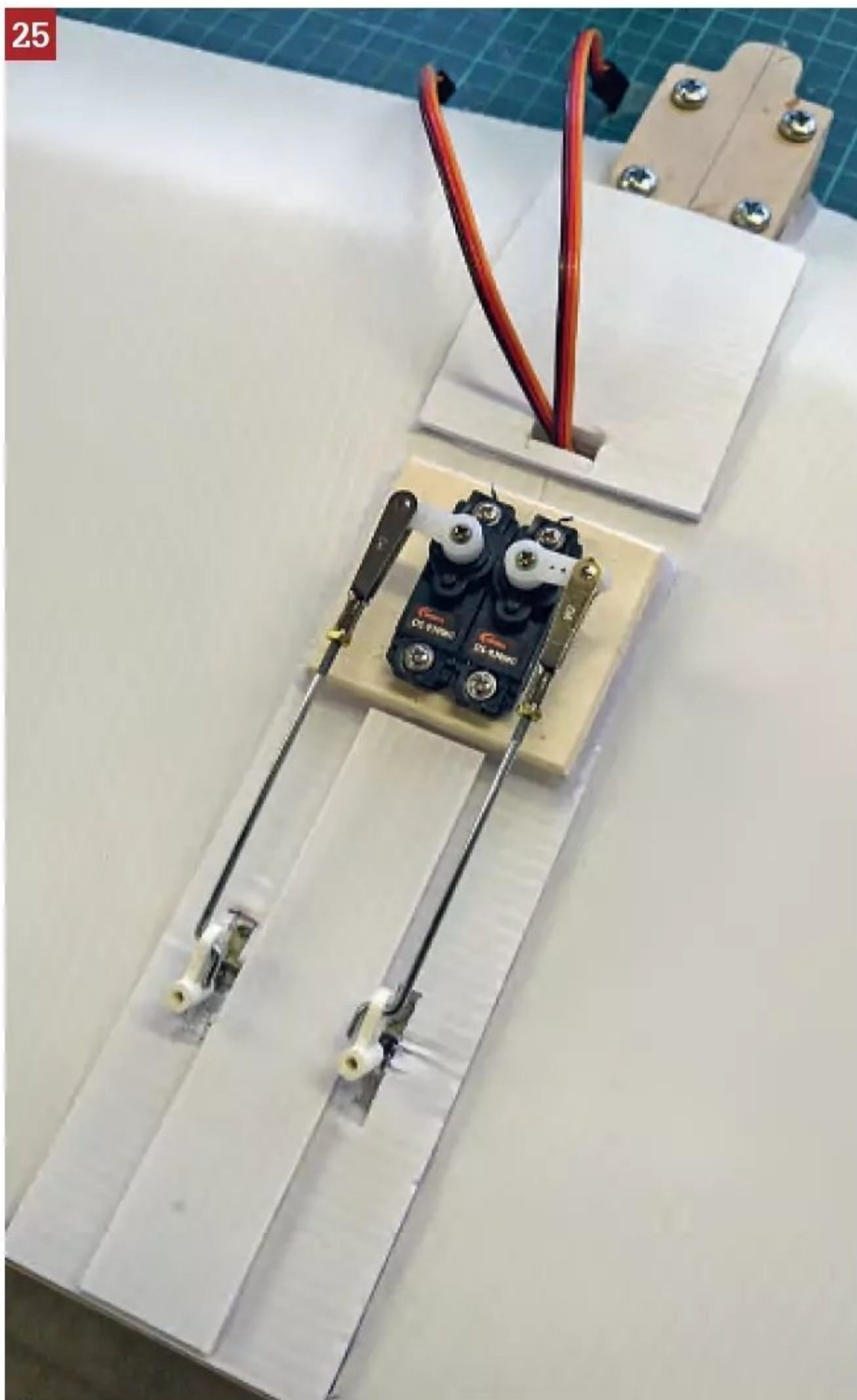
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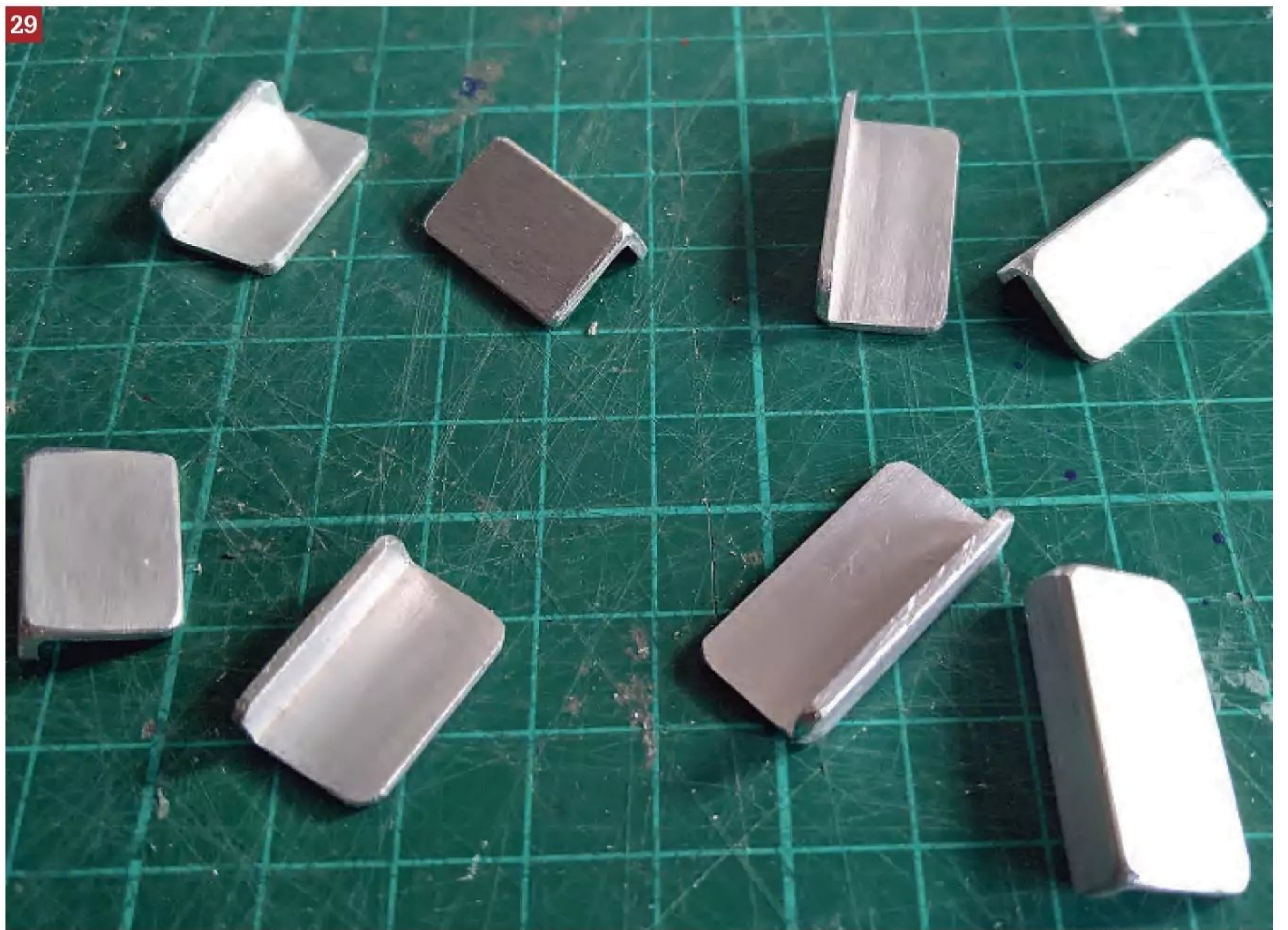
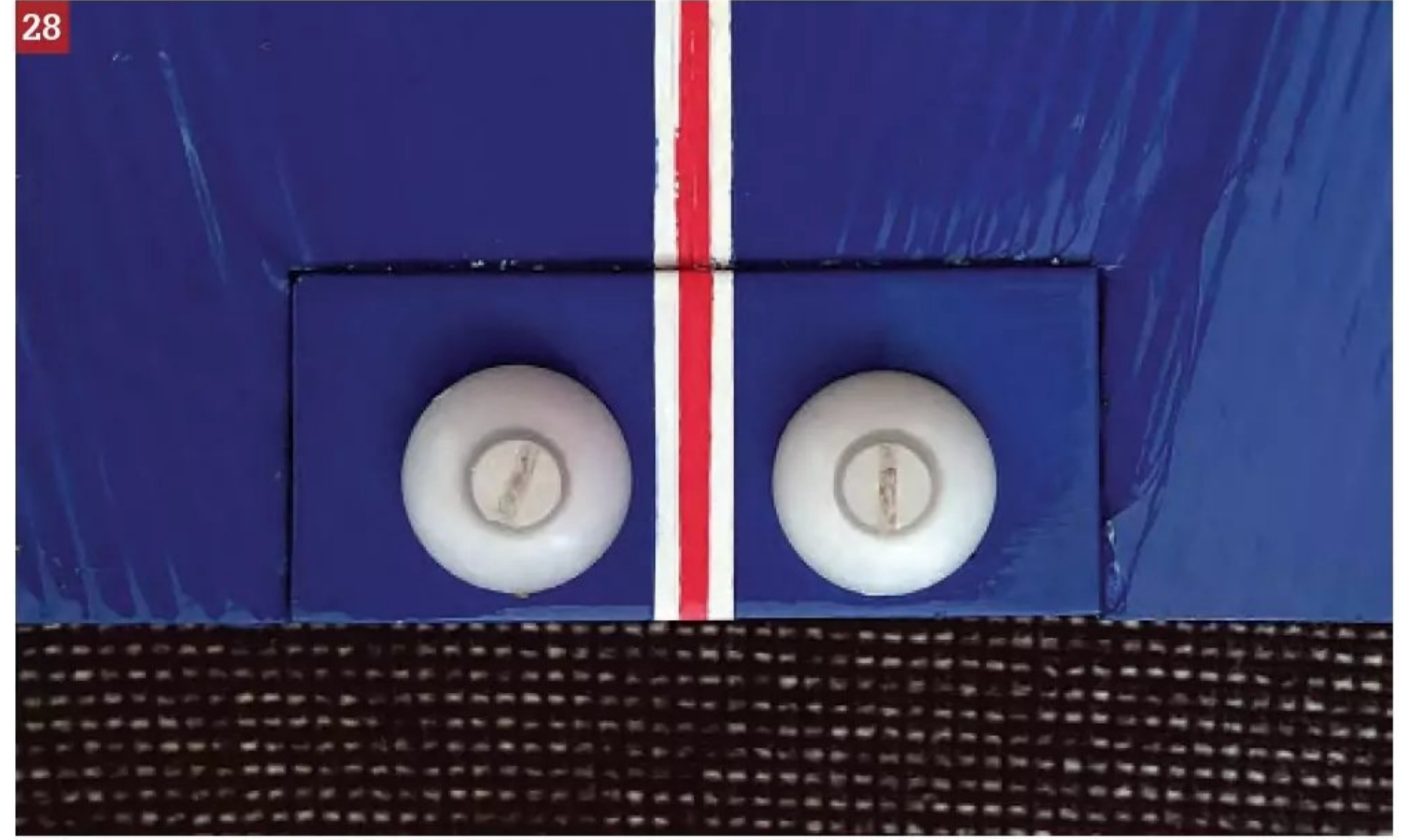


will see a view showing the torque rod detail which I have also included here for reference. (**Image 21**)

I usually add bridging pieces of 3mm Correx over the upper surface of the wing joint as shown, ensuring a gap is left to avoid fuselage former F4. These add a little more strength but also help in raising the mounting height for the aileron servos because the servos are too deep to fit within this particular wing section. The servos are best positioned just rearward of F4. Positioned like this the two control linkages work out to be around 30 mm apart so mark that distance on to the upper surface of the wing. Also mark lines where the torque rods will run inside the make-up piece, which is now sandwiched between the upper and lower wing surfaces. Slide the spokes inside the make-up piece from the aileron end; holding the wing up to the light will help in doing this. (**Image 22**)

Cut down through the Correx to expose the spokes, creating an 'H' pattern to allow for linkage movement. (**Image 23**)

The torque rods are produced from stainless steel bike spokes of around 300 mm in length, with the right-angled end cut off to leave a straight spoke which is threaded at one end. It is worth grinding the cut end to a bit of a point



to aid installation. The threaded end needs to be bent up by 90 degrees at around 20 mm distance from the end. The main body of the spoke locates within a channel of the 3 mm make-up piece, directly in line with the defluted aileron hinge channel. The spoke will be a loose fit within the channel so a short length of sleeving is required to remove any slop within the torque rod mechanism. Biro tubing can sometimes be found in the right size; you want any sleeving to fit snugly within the Correx channel whilst at the same time allowing free movement of the torque rod within it. (Image 24)

Insert each torque rod into their respective channels from the inboard end such that the pointed ends of the rods are now within each aileron's hinge channel. Once inserted, the pointed end of each rod must then be bent at 90 degrees such that it can be inserted into the aileron itself, puncturing the walls within it in the process (hence the sharpened point). You need to ensure that the threaded end of the rod is firmly held at the correct angle to suit the servo linkage whilst doing this. Aim to make this bend as tight a right angle as possible to help the rod sit neatly within the aileron hinge channel.

Cut a suitably sized servo mounting tray from some 3 mm ply. Hot melt glue it in place and cut through the upper surfaces of Correx to accommodate the servos. Cut a hole in the forward portion of the wing to feed the servo leads through. Once done, fit the servos, screw on some aileron horns and make up some quick-link linkages to complete. (Image 25)

The Hawk plans don't specify a method of wing retention. The normal method is by dowels and rubber band. Once again, for neatness and a more scale-like appearance, I generally opt to use wing bolts through the trailing edge combined with a ply location tang screwed to a further block of wood or ply bonded to the upper surface of the wing's leading edge. For the wing bolt seating I cut a 3 mm ply spreader plate and cut away the lower thickness of Correx to accommodate it. (Image 26 - 28)

If you decide to use rubber bands then it is worth protecting the leading and trailing edges of the Correx where the rubber bands will ultimately sit to prevent them being crushed over time. Some pieces of aluminium or plastic angle cut down to size and glued in place will do the trick. (Image 29 & 30)

TO BE CONTINUED. ■





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HOLLY BUDDY

Peter Vivian builds his first home made diesel from the engine plans designed by Ed Holly

Words & Photos **Peter Vivian**

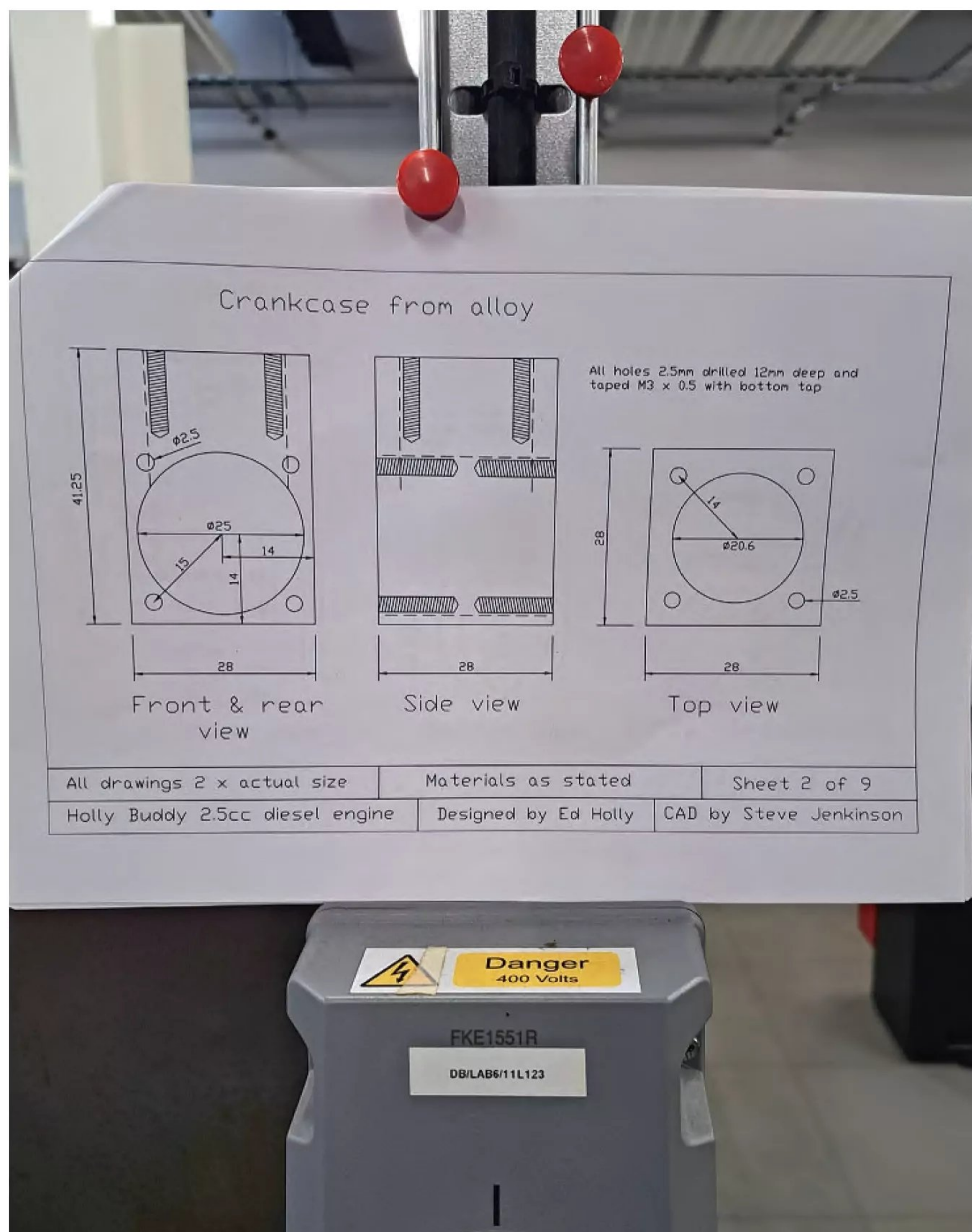


For anyone with some experience of machining, making a Holly Buddy diesel engine should be a relatively easy project.

When I received my first diesel engine, a 1 cc DC Spitfire, at the age of 11 or 12, I wondered if it would ever be possible to build one of my own. Fast forward 50 years and I became aware of the Holly Buddy 2.5 cc diesel engine designed for the home builder. This design didn't need any castings, it all being machined out of solid materials. I mentioned it to a colleague of mine at the university where we both work who, like me, was an erstwhile aeromodeller returning to the hobby after many years. I need to point out at this stage that whilst I have been a 'maker' for over 50 years, almost exclusively in wood, I could count the number of times I've attempted any model engineering on the fingers of one foot!

THE PLAN BECOMES A REALITY

Nothing much happened for another couple of years. But then, just before Christmas 2023, my colleague said, "As we have no students for the first week when we return after the Christmas break, would you like to have a go at building the engine under the banner of 'professional development.'" I have to say I was a little nervous owing to my total lack of experience, but I said, "Yes, I'd love to give it a go."



Well detailed plans are easily sourced online.

“We started by machining the crankcase from aluminium on the milling machine”

PUTTING THE PLAN INTO PRACTICE

I'm employed in the prototyping workshop of the university, working mainly in wood, man-made materials including plastics, foam and composites. My colleague runs the machine shop. He had already downloaded the plans from the internet and prepared all the materials when I returned.

We started by machining the crankcase from aluminium on the milling machine. I had a lot of help with setting up the machinery as a complete novice but anyone with a bit of experience would find most of the techniques straightforward. When the crankcase was machined to the correct external dimensions, we then bored it out vertically to receive the cylinder liner and horizontally to receive the 'nose'. Then the holes for mounting the cylinder head and backplate were drilled and tapped to accept 4 mm set screws.

Next was the nose, again from aluminium. This has a taper which was a bit of a challenge, but I enjoyed seeing the shape emerge from a solid bar. This had to be drilled and reamed to accept the crankshaft. The instructions called for a particular size of bearing, but this proved to be virtually impossible to source (the engine was designed in North America). So, we adapted the design to accept what was available.

HEADS UP

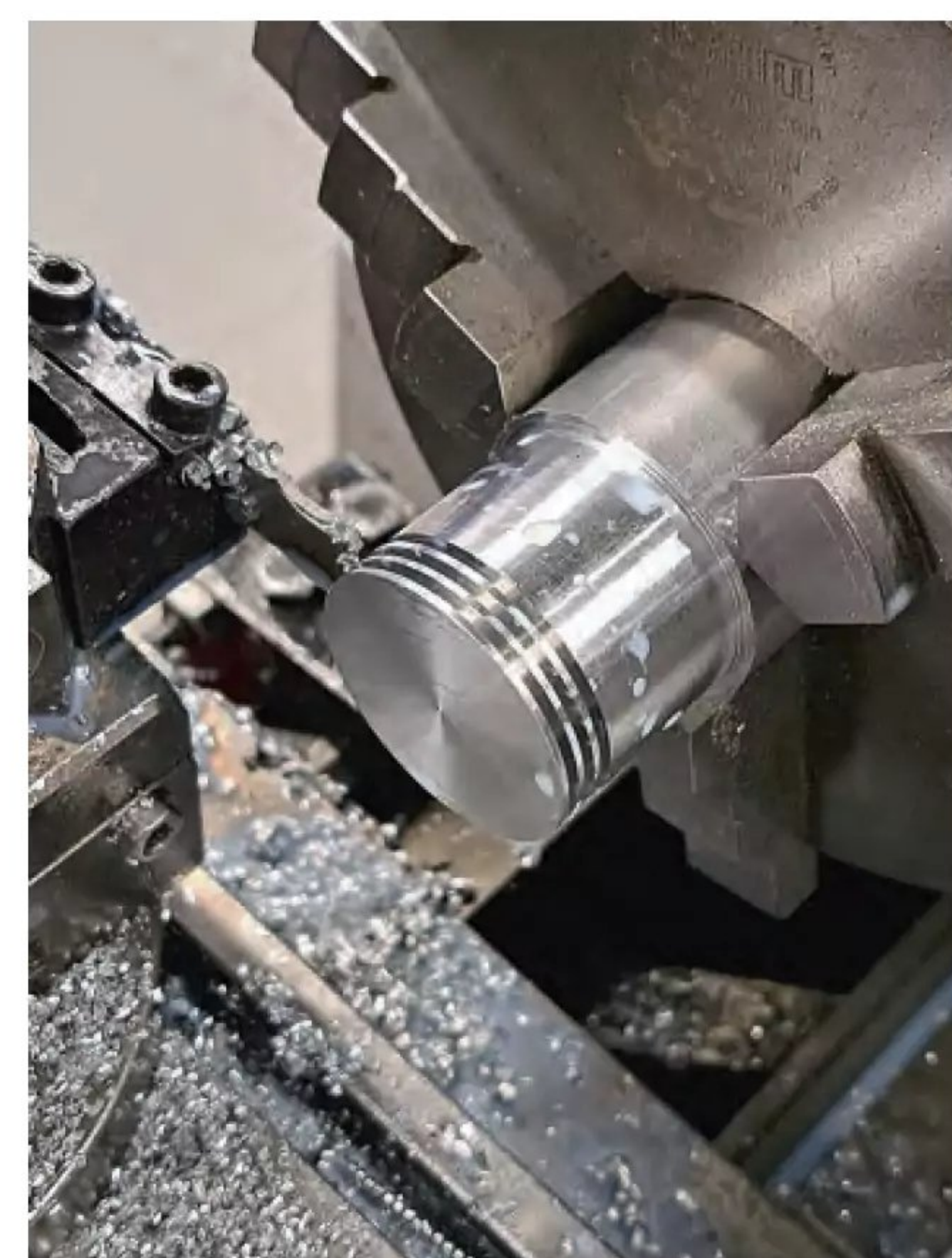
We tackled the cylinder head next, again in aluminium. This was straightforward, although my colleague had to grind a parting off tool →



After the crankcase was machined to the correct dimensions holes for mounting the cylinder head and backplate were drilled and tapped.



The crankcase was bored out vertically to receive the cylinder liner and horizontally to receive the engine's 'nose'.



A parting off tool was ground down to cut the slots between the cylinder head fins.

to be able to cut the slots between the fins. The backplate was turned next, again fairly simple, but the mounting flange had to be milled to produce the flats, I think to reduce the weight.

With the prop driver turned and its face scribed to reduce the chance of the propeller slipping, a venturi - just a simple tube - was turned. A stopped hole was drilled in the nose to accept it and the two were glued together with metal epoxy resin and the assembly left to fully harden over the weekend. This completed all the external parts.

MOVING ON

Model diesel engines have only three moving parts so I thought it would be quick and easy to make these. I was wrong! I have to say I struggled to achieve the necessary accuracy for these parts, again down to a lack of experience.

First, we tackled the piston. This was turned from cast iron and then drilled and reamed to size. The contra piston was turned at the same time and parted off from the piston. The cross hole for the gudgeon pin was done on the mill.

The cylinder liner was tackled next, made from a free cutting steel. It is a relatively simple turned part but the slots for the ports had to be created using a slitting saw on the mill.

After the crankshaft had been turned from silver steel the big end bearing had to be created using a technique called off-centre or eccentric turning using a 4-jaw chuck rather than the 3-jaw chuck used up until now; again, I had a lot of help setting this up. The angled cuts for the counterweight were done on the mill.

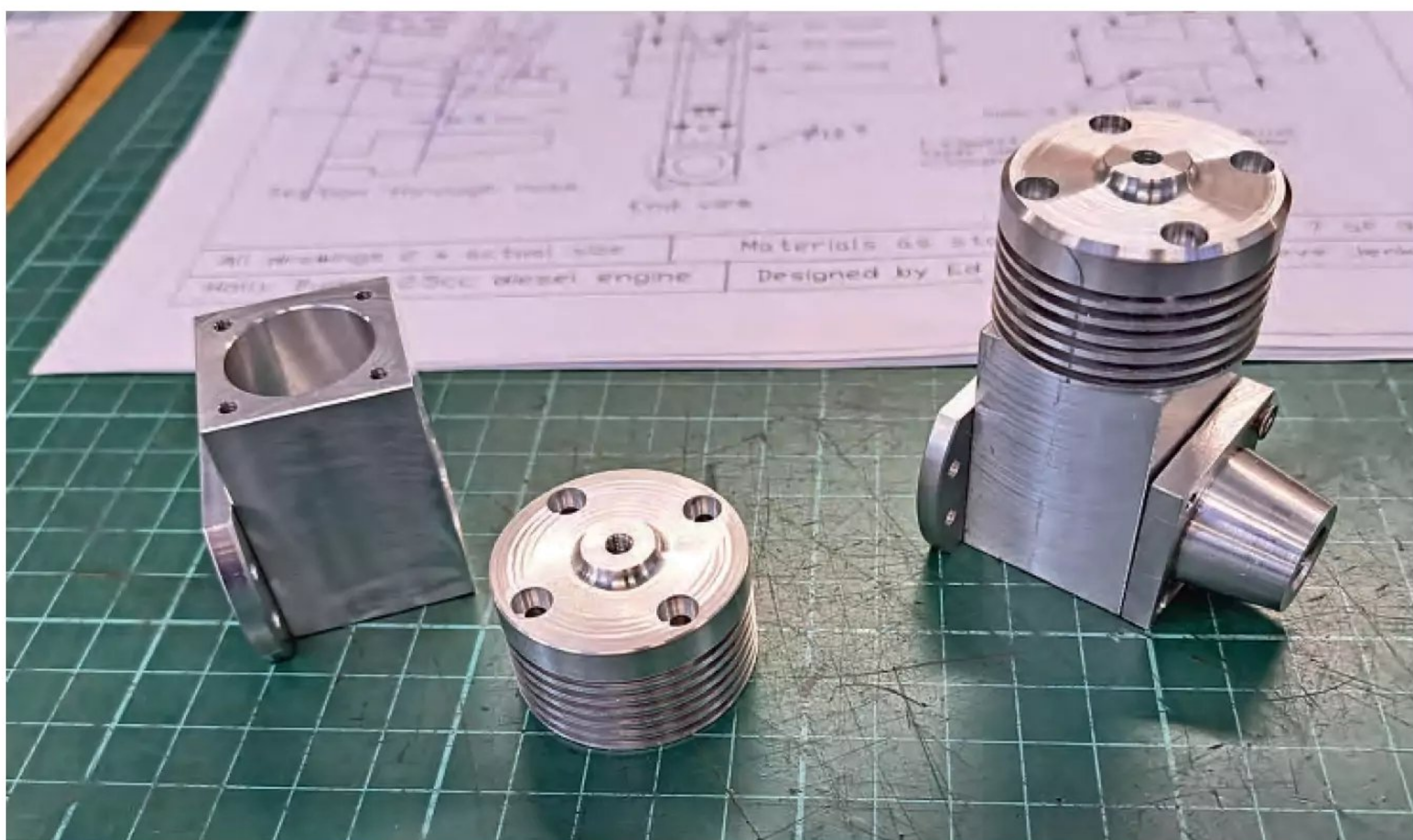
We were lucky to have access to a CNC mill, so we cheated a bit and created the connecting rod from aluminium on this. Obviously, it could be made without this luxury.

FIT & FINISH

'Spraybars' or needle valve assemblies in brass are available for around £3.50 so we opted to



Finished crankcase.



Non-moving parts of the Holly Buddy engine are all machined out of solid materials.



Turning the crankcase on the lathe.



Rear view of the finished engine.



The engine runs well but is very sensitive to the compression screw setting. A locking lever made from 2 mm copper sheet keeps it in the desired position.



Peter found making his Holly Buddy to be a steep but satisfying learning experience.

compression screw was simply made by silver soldering a 2 mm diameter piece of silver steel to the top of a 4 mm socket cap set screw.

FALSE START

It became clear quite quickly there were several issues with my engine. Initial attempts at starting resulted in a bent conrod so a new one had to be made. This was probably caused by winding the compression screw in too far. This highlighted another problem; the screw would not stay in the desired position, so I quickly made a couple of locking levers from 2 mm copper sheet which worked well. Turning the engine over, I could feel something rubbing. We deduced it was the conrod contacting the backplate, so we machined off another .25 mm. The compression was deemed insufficient, so a replacement piston was made. Again, my inexperience surfaced as the crankshaft appeared to have a bit too much play where it passed through the nose, so this had to have a brass bush turned and inserted.

With all these issues addressed it was time for another attempt at starting. This brought back many memories from 50 years ago, complete with a sore index finger! After a considerable time, we were rewarded with a few pops and bangs but a reluctance to run for more than a second. Doubts were raised about the condition of the fuel; it was in a sealed container but was at least twenty years old. New fuel was purchased, not an easy task these days. This didn't make any difference. Persistence pays and after many tries and a few expletives the engine finally burst into life and, more importantly, continued to run. Leaning out the needle valve the engine picked up and really started to sing. Big smiles all round! It turned out that it was particularly sensitive to the compression screw setting. The difference between firing and running was the smallest amount imaginable.

FINAL ANALYSIS

For anyone with any experience of machining I think this would be a fairly easy project. For me it was a steep but satisfying learning curve. The engine probably won't see active duty and is currently on display with its twin sister and other types of engines made in the machine shop.

Huge thanks to Mike Hacon. Without his help this project would never have got off the ground - pun intended! ■



Peter teamed up with a work colleague so that they could both make a Holly Buddy engine. The pair of 2.5 cc diesels are seen here, looking dapper on their display stands.

buy them. I had some stainless dome nuts which I thought would look better than a plain prop nut, but the threaded portion of the crankshaft was too long for these to hold the prop in place. Rather than cut this down we made a spacer matching the angle of the nose, to solve the problem.

The order of assembly went something like this:

The bearing was pressed into the crankcase, the nose was bolted to the crankcase, the

crankshaft was inserted into these. The con rod was fitted to the piston with a silver steel gudgeon pin, ensuring it didn't protrude past the outside of the piston which would ruin the liner. The piston and con rod were placed in the crankcase ensuring the big end of the conrod slipped onto the crankshaft bearing. Next the liner was fitted over the piston and into the crankcase ensuring the contra piston was inserted in the top of the liner. Finally, the backplate was screwed in place. The

SLINGSBY TYPE 23 KITE

Chris Williams returns with part two of his latest Pro-Plan article describing the build and flying of the Slingsby prototype glider

Words & Photos **Chris Williams**

The entire model was covered with HK film, with the open structure areas sporting matt clear film. The compound curves of the fuselage were complicated by the two-tone livery but once the top colour had been added it was relatively simple to add the white. The secret seems to be to iron on the film in sections and not to do too large an area in one go. Temperature control is the key to the whole thing and it might be worth looking back at a previous article of mine in RCM&E, February '22 on the subject entitled 'Old Dog, New Tricks'.



Air to air action over White Sheet.



The author gives scale to this handily sized model.



Job done and ready to cover.



Score the filler applied to the centre section before it dries hard!

“...the piano wire wing joiner is strong enough to hold the wings whilst they are rigged. The struts take all the flying loads”

FINAL ASSEMBLY

As there was not enough room for a 5-cell NiMh receiver battery, a 2S LiFe was used instead. The ply base was cut to fit in between the formers and fixed in place with copious amounts of polyurethane sealer.

The release servo was epoxied to the side of the fuselage with a small length of TE stock in order to give access to the servo arm screw. A 4 oz plate of lead was screwed to the inside of F1 and additional pieces of lead taped to the battery to achieve the optimal CG position.

A length of 1 mm piano wire is fitted with a Z-bend at one end and attached to the detached arm of the release servo; the other is pushed through the MPX style tow release from the inside. The servo arm is fitted, the Rx switched on, the servo set to the closed position and the piano wire cut off at the front.

Note that the piano wire wing joiner is only strong enough to hold the wings conveniently whilst they are rigged. The struts take all the flying loads and insulating tape holds the wings together.



Tail view of the newly constructed Slingsby Kite Type 23.



Pre-maiden pic!

“Although not fitted with spoilers, the up-going ailerons provide plenty of glide path control”



View of one of the aileron servo installations.



View of the Kite's underside.



Taking off behind the aerotow tug at CMFC.



This shot shows the up-going ailerons deployed for glide path control.



The Kite soars above a rapidly dispersing cloud inversion at CMFC.



Scan this QR code for construction shots and views of the Slingsby Kite Type 23.



In action from the slope with the Wessex Soaring Association.

FLYING

With the CG in the ‘safe’ spot shown on the plan a hand launch into a gentle breeze should show everything as it should be. The CG can be moved further back according to preference. The prototype shows no vices, with a long flat glide and no tendency to drop a wing at low speed. Although not fitted with spoilers, the up-going ailerons provide plenty of glide path control. There are no reasons why spoilers could not be fitted. It’s just that with smaller models it’s usually wise to keep the wing loading as low as possible.

As ever, the full consignment of the photos of the build process is available FOC from me: c_williams30@sky.com ■

DATAFILE

Name:	Slingsby Kite Type 23
Model type:	Scale glider
Scale:	1:5.7
Designed by:	Chris Williams
Wingspan:	2.5 m (98.43")
Weight:	4 lbs (1.8kg)
Wing Section:	HQ 35/12
Functions (servos):	Ailerons (2), Rudder (1), Elevator (1), Tow release (1)
Control Throws	
Ailerons:	20 mm up, 10 mm down
Elevator:	25 mm up, 15 mm down
Rudder:	40 mm each way
Brakes:	Ailerons raise up 28 mm
Coupled Ail & Rudd:	60%
(All measurements taken from the trailing edges)	

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PPL-60C2S-1000	60C/120C, 2S (7.4V) 1000mAh	£9.25
PPL-60C2S-1300	60C/120C, 2S (7.4V) 1300mAh	£11.00
PPL-40C2S-1800	40C/80C, 2S (7.4V) 1800mAh	£14.50
PPL-60C2S-2200	60C/120C, 2S (7.4V) 2200mAh	£18.25
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PPL-40C2S-3300	40C/80C, 2S (7.4V) 3300mAh	£25.00

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PPL-60C3S-0800	60C/120C, 3S (11.1V) 800mAh	£12.00
PPL-60C3S-1000	60C/120C, 3S (11.1V) 1000mAh	£15.00
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PPL-60C3S-3300	60C/120C, 3S (11.1V) 3300mAh	£38.00
PPL-60C3S-3700	60C/120C, 3S (11.1V) 3700mAh	£43.00
PPL-60C3S-4500	60C/120C, 3S (11.1V) 4500mAh	£55.50
PPL-40C3S-5000	40C/80C, 3S (11.1V) 5000mAh	£56.50
PPL-60C3S-6000	60C/120C, 3S (11.1V) 6000mAh	£70.00

PPL-60C4S-1800	60C/120C, 4S (14.8V) 1800mAh	£30.00
PPL-60C4S-2200	60C/120C, 4S (14.8V) 2200mAh	£33.50
PPL-60C4S-2600	60C/120C, 4S (14.8V) 2600mAh	£39.50
PPL-60C4S-3300	60C/120C, 4S (14.8V) 3300mAh	£49.00
PPL-60C4S-3700	60C/120C, 4S (14.8V) 3700mAh	£55.00
PPL-60C4S-4500	60C/120C, 4S (14.8V) 4500mAh	£70.00
PPL-60C4S-5000	60C/120C, 4S (14.8V) 5000mAh	£78.50
PPL-60C4S-6000	60C/120C, 4S (14.8V) 6000mAh	£96.00

PPL-60C5S-3300	60C/120C, 5S (18.5V) 3300mAh	£63.00
PPL-60C5S-3700	60C/120C, 5S (18.5V) 3700mAh	£71.00
PPL-60C5S-4500	60C/120C, 5S (18.5V) 4500mAh	£86.50
PPL-60C5S-5000	60C/120C, 5S (18.5V) 5000mAh	£96.00
PPL-60C5S-6000	60C/120C, 5S (18.5V) 6000mAh	£118.00

PPL-60C6S-3300	60C/120C, 6S (22.2V) 3300mAh	£79.00
PPL-60C6S-3700	60C/120C, 6S (22.2V) 3700mAh	£85.00
PPL-60C6S-4500	60C/120C, 6S (22.2V) 4500mAh	£103.00
PPL-60C6S-5000	60C/120C, 6S (22.2V) 5000mAh	£115.00
PPL-60C6S-6000	60C/120C, 6S (22.2V) 6000mAh	£139.00

Prop Drivers/Adapters

PP-PDRV20-30	For 2.0mm shafts	£3.49
PP-PDRV23-47	For 2.3mm shafts	£2.50
PP-PDRV30-50	For 3.0mm shafts	£2.75
PP-PDRV32-50	For 3.2mm shafts	£2.75
PP-PDRV40-50	For 4.0mm shafts	£2.95
PP-PDRV50-80	For 5.0mm shafts	£3.95
PP-PDRV60-60	For 6.0mm shafts	£4.75
PP-PDRV80-12	For 8.0mm shafts	£5.95
PP-PDRV10-12	For 10.0mm shafts	£7.95



Brushless Electronic Speed Controllers

4M-HESC12A	12A, Burst 15A, 5.5V 1A BEC	£16.49
4M-HESC20A*	20A, Burst 25A, 5V 1A BEC	£18.99
4M-HESC30AV2*	30A, Burst 40A, 5V 5A BEC	£22.99
4M-HESC40AV2*	40A, Burst 50A, 5V 5A BEC	£31.95
4M-HESC50AV2*	50A, Burst 70A, 5V 5A BEC	£45.95
4M-HESC60A35V2*	60A, Burst 80A, 5V 7A BEC	£47.95
4M-HESC60A40V2*	60A, Burst 80A, 5V 7A BEC	£47.95
4M-HESC80AV2**	80A, Burst 100A, 5V 5A BEC	£62.00
Fly Fun 110A HV	110A, Burst 140A, OPTO, 6-14 LiPo	£129.99
Fly Fun 130A HV	130A, Burst 160A, OPTO, 6-14 LiPo	£141.99
Fly Fun 160A HV	160A, Burst 200A, OPTO, 6-14 LiPo	£189.99

* XT60, ** XT90 on battery side



UBEC's (Voltage Stabilisers/Regulators)

4M-UBEC5A	5A UBEC, 7A Peak, 6-29.4V I/P	£14.99
4M-UBEC-7A	7A UBEC, 7.5A Peak, 6-29.4V I/P	£19.99
HW-UBEC10A	10A UBEC, 15A Peak, 3-25V I/P	£34.99
4M-UBEC-15A	15A UBEC, 28A Peak, 9-51V I/P	£29.99
HW-UBEC25A	25A UBEC, 50A Peak, 3-75.6V I/P	£64.99
5A UBEC	With Switch and Digital Display	£16.99
15A UBEC	With Switch and Digital Display	£29.99

Outrunners - Professional Black Series

PO-2826-	920kv, 1040kv, 1290kv, 1420kv, 2200kv	£22.99
PO-2830-	980kv, 1210kv, 1350kv , 2150kv, 2700kv	£25.49
PO-2834-	910kv, 1020kv, 1160kv, 1680kv, 2100kv	£27.49
PO-3535-	870kv, 1090kv, 1390kv	£28.99
PO-3541-	810kv, 920kv, 1070kv , 1270kv	£33.49
PO-3547-	700kv, 800kv, 960kv, 1190kv	£35.99
PO-5055-	500kv, 595kv	£61.00
PO-5065-	360kv, 420kv	£75.50
PO-6366-	230kv	£99.99

Part numbers in **RED** are approved by the BMFA for their Payload and Egg Challenges



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	Part Number	Type	Torque / Speed	Price
	4M-037AH-0045	Analog Sub Micro 3.7g	0.45Kg @ 4.8V - 0.10sec/60° 0.55Kg @ 6.0V - 0.08sec/60°	1pcs £6.84ea 5pcs £6.16ea
	4M-045DH-005	Digital Sub Micro 4.5g	0.5Kg @ 4.8V - 0.10sec/60° 0.6Kg @ 6.0V - 0.08sec/60°	1pcs £4.72ea 5pcs £4.25ea
	4M-056DHVMG-009 (High Voltage)	Digital Metal Geared Only 8mm Thick - 5.6g	0.90Kg @ 4.8V - 0.14sec/60° 1.05Kg @ 6.0V - 0.12sec/60° 1.20Kg @ 7.4V - 0.10sec/60°	1pcs £9.94ea 5pcs £8.95ea
	4M-094DMGB-014	Digital Metal Geared Ball Raced Wing Servo	1.4Kg @ 4.8V - 0.12sec/60° 1.9Kg @ 6.0V - 0.10sec/60°	1pcs £11.54ea 5pcs £10.39ea
	4M-090AH-017	Micro Analog 9g	1.7Kg @ 4.8V - 0.09sec/60° 1.9Kg @ 6.0V - 0.07sec/60°	1pcs £3.99ea 5pcs £3.59ea
	4M-100AMG-022	Micro Analog Metal Geared - 10g	2.2Kg @ 4.8V - 0.12sec/60° 2.5Kg @ 6.0V - 0.10sec/60°	1pcs £7.49ea 5pcs £6.74ea
	4M-100DMG-022	Micro Digital Metal Geared - 10g	2.2Kg @ 4.8V - 0.12sec/60° 2.5Kg @ 6.0V - 0.10sec/60°	1pcs £9.05ea 5pcs £8.15ea
	4M-094DHVMG-026 (High Voltage)	Digital Metal Geared - 9.4g Ball Raced, 8mm Thick	2.0Kg @ 6.0V - 0.09sec/60° 2.6Kg @ 7.4V - 0.07sec/60°	1pcs £14.99ea 5pcs £14.17ea
	4M-160AH-027	Mini Analog 16g	2.7Kg @ 4.8V - 0.13sec/60° 3.0Kg @ 6.0V - 0.11sec/60°	1pcs £6.29ea 5pcs £5.66ea
	4M-175AMG-030	Mini Analog Metal Geared - 17.5g	3.0Kg @ 4.8V - 0.13sec/60° 3.5Kg @ 6.0V - 0.11sec/60°	1pcs £8.73ea 5pcs £7.86ea
	4M-175DMG-030	Mini Digital Metal Geared - 17.5g	3.0Kg @ 4.8V - 0.13sec/60° 3.5Kg @ 6.0V - 0.11sec/60°	1pcs £9.99ea 5pcs £8.99ea
	4M-253AB-028	Standard/Mini Size Ball raced - 25.3g	2.8Kg @ 4.8V - 0.12sec/60° 3.3Kg @ 6.0V - 0.10sec/60°	1pcs £6.79ea 5pcs £6.11ea
	4M-410ABH-052	Standard Analog 41g	5.2Kg @ 4.8V - 0.20sec/60° 6.5Kg @ 6.0V - 0.16sec/60°	1pcs £4.73ea 5pcs £4.26ea
	4M-455AH-033	Standard Analog 45.5g	3.3Kg @ 4.8V - 0.15sec/60° 4.0Kg @ 6.0V - 0.12sec/60°	1pcs £6.99ea 5pcs £6.29ea
	4M-556AMG-087	Standard Analog Metal Geared - 55.6g	8.7Kg @ 4.8V - 0.15sec/60° 9.4Kg @ 6.0V - 0.13sec/60°	1pcs £12.59ea 5pcs £11.33ea
	4M-556DMG-087	Standard Digital Metal Geared - 55.6g	8.7Kg @ 4.8V - 0.15sec/60° 9.4Kg @ 6.0V - 0.13sec/60°	1pcs £15.74ea 5pcs £14.17ea
	4M-620DHVMG-112 (High Voltage)	Digital HV Metal Geared Dual Ball Raced 62g	9.35Kg @ 6.0V - 0.15sec/60° 11.2Kg @ 7.4V - 0.13sec/60°	1pcs £18.89ea 5pcs £17.00ea
	4M-556AMG-118	Standard Analog Metal Geared - 55.6g	11.8Kg @ 4.8V - 0.20sec/60° 13.2Kg @ 6.0V - 0.18sec/60°	1pcs £14.69ea 5pcs £13.22ea
	4M-556DMG-173	Standard Digital Metal Geared - 55.6g	17.3Kg @ 4.8V - 0.18sec/60° 20.4Kg @ 6.0V - 0.16sec/60°	1pcs £17.84ea 5pcs £16.06ea

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HOTA D6 Pro - Dual I/P, Dual O/P 650W Charger



The D6 Pro is a dual I/P (AC & DC) and dual O/P high quality charger with each output capable of charging. It can charge between 2S - 6S LiPo, LiHV, LiFe and Li-ion batteries, Eneloop, Ni-Cd, Ni-MH, Ni-Zn. It also features wireless charging so you can charge your phone at the field. Great Value for just.

New

£109.99

HOTA F6+ - Dual I/P, Quad O/P 1000W Charger



The F6+ features dual I/P (100VAC - 240VAC & 6.5VDC - 30VDC) and has 4 high powered outputs each can charge up to 250W. It can charge between 2S - 6S LiPo, LiHV, LiFe and Li-ion batteries, each up to 15A. 1S - 12S Eneloop, Ni-Cd, Ni-MH, Ni-Zn. Brilliant Value for just.

New

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HOTA H6 Pro - Dual I/P, 700W Charger



The H6 Pro Smart Charger features dual I/P (100VAC - 240VAC & 6.5VDC - 30VDC) and can deliver up to 700W, 200W on AC (max 26A). This is the charger when you need large packs charged quickly. Balance current 2A Fantastic Value for just.

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HOTA S6 - Dual I/P, Dual O/P 650W Charger



The S6 is a high quality dual I/P (AC & DC) and dual O/P high quality charger with each output capable of charging. It can charge between 2S - 6S LiPo, LiHV, LiFe and Li-ion batteries, Eneloop, Ni-Cd, Ni-MH, Ni-Zn. Outstanding Value for just.

New

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ToolKitRC M4 Pocket - 80W O/P Charger



The ToolkitRC M4 Pocket is a small but powerful ~80W charger featuring dual input (USB Type-C / XT60) and dual output (XT60 / XT30). The charger can charge up to 4S LiPo/LiHV/LiFe batteries. It can also be used to charge USB mobile devices with a USB-C socket. It features a 1.54" Wide angle colour display

£24.99

ToolKitRC M4Q - 200W Quad Out Charger



The M4Q is a 4 in 1 charger that has 4x 50W charging circuits when powered by DC (4x 25W when powered by AC). Allowing you to balance charge 4 batteries at the same time. It features an internal power supply so you can just plug it into your nearest mains socket. It can also be powered by DC when at the field.

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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.

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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 a fantastic low price of

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ToolKitRC M9 - Dual I/P & Dual O/P, 700W



So many functions in a small charger! Battery internal resistance checker, wattmeter, servo tester, (Can output PWM/PPM/SBUS standard signal, accuracy up to 1µs) LiPo balancer. It also charges all the main types of rechargeable cell up to 25A. USB type A & C outputs

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ToolKitRC M8P - Up to 20A (600W) Charging Power!



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ToolKitRC M6DAC -



The M6DAC incorporates two high performance chargers that can be powered by AC or DC. It features 2x 2-6 cell 350W chargers and a 5V USB output that can be used to your phone or go pro at the field. Each output is normally 350W but if used in the asynchronous mode that doubles to a huge 700W!

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Fed up at how long it takes you to discharge your unused batteries? Then this is the discharger you have been waiting for. This can discharge your batteries up to 35A! (max 250W). Just set the discharge current and the end voltage you require and push the button, simple as that. We recommend that you just finish the storage process off on your charger.

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Package	Supplied Prop	Static Thrust @11.1V	Est. Speed
1000kv	10x6	515g/ 1.14lbs	35MPH
1200kv	9x5	635g/ 1.40lbs	42MPH
1400kv	8x6	810g/ 1.79lbs	55MPH
1800kv	7x3.5	490g/ 1.08lbs	52MPH
2200kv	6x3.5	470g/ 1.04lbs	59MPH

Each Power Pack consists of

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Plan	MW2618	£19.00
Laser Cut Wood Pack	WP2618	£126.00
Additional Wood Pack	AWP2618	£98.00
FG Cowl	CF2618CL	£25.00
Photo CD	FF26	£4.99

SAVE: Buy the set & save up to 10% on the component parts

Short Kit (Set) SET2618 £244.00

Short Kit (Set) Includes: Plan, FG Cowl, Focus File CD, Laser Cut Wood Pack & Additional Wood Pack



Plan & Articles	RC2259	£17.00
Laser Cut Wood Pack	WPRC2259	£95.00
Additional Wood Pack	AWPRC2259	£84.00

SAVE: Buy the set & save up to 15% on the component parts

Short Kit (Set) SETRC2259 £176.00

Short Kit (Set) Includes: Plan, Articles, Laser Cut Wood Pack and Additional Wood Pack.

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Additional Wood Pack	AWPRC2257	£42.00

SAVE: Buy the set & save up to 10% on the component parts

Short Kit (Set) SETRC2257 £88.00

Short Kit (Set) Includes: Plan, Article, Laser Cut Wood Pack & Additional Wood Pack



Plan & Article	MW2902	£29.00
Laser Cut Wood Pack	WP2902	£157.00
Additional Wood Pack	AWP2902	£225.00
Canopy, ABS Cowls & Spinners	CA2902SET	£39.00

SAVE: Buy the set & save up to 10% on the component parts

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Short Kit (Set) Includes: Plan, Article, Laser Cut Wood Pack & Additional Wood Pack



Plan & Article	RC2238	£17.00
Laser Cut Wood Pack	WPRC2238	£50.00
Additional Wood Pack	AWPRC2238	£17.00

SAVE: Buy the set & save up to 10% on the component parts

Short Kit (Set) SETRC2238 £75.00

Short Kit (Set) Includes: Plan, Article, Laser Cut Wood Pack & Additional Wood Pack



Plan	MW2216	£14.50
Laser Cut Wood Pack	WP2216	£86.00
Additional Wood Pack	AWP2216	£93.00

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Short Kit (Set) SET2216 £173.00

Short Kit (Set) Includes: Plan, Laser Cut Wood Pack & Additional Wood Pack



SZD
FOKA 4

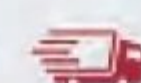
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Basic 3D (52" & 58") SETRC2028 £175.00	Mayfly 6-E (56") SET3789 £158.00
Cessna 120 (62") SET3346 £212.00	Messerschmitt Me163 (49.75") SET3347 £208.00
Chilli Breeze (Electric) (48") SETRC2259 £176.00	Minnow (53") SET3571 £195.00
Clean Sweep (47") SETRC2092 £179.00	Oodalally (53") SETRC2115 £164.00
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Delta Lady (54") SET2216 £173.00	Red Raw (63") SET3412 £175.00
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Ellipse (49") SETRC2128 £171.00	Rusty Ferguson Crop Duster (65") SETRC2229 £257.00
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Firedrake (52") SETRC2010 £198.00	Slingsby Type 30 Prefect (2.3m) SETRC2252 £202.00
Flycatcher (54") SETRC2148FLY £157.00	Speedtwin ST2 (45") SETRC2105 £163.00
Fournier RF4 (74") SETRC2085 £188.00	Stampe SR-7 (53") RETRC2228 £175.00
Goldie (50") SET3123 £162.00	Stella Clipper (62") SET3798 £201.00
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Grumman F7F Tigercat (40") SET3662 £184.00	Super Acro-Zenith (44") SET3512 £180.00
Hanger Monkey (56") SETRC2165 £205.00	Super Slinky (38") SETRC2112 £169.00
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Junkers JU88 A-4 (58.5") SET3439 £182.00	Werewolf (52") SETRC2045 £207.00
Kyten (44") SET3395 £178.00	Westland-Hill Pterodactyl Mk.IV (60") SET3501 £194.00
Lazy Kitten (72") SET2294 £166.00	Vans Aircraft RV-4 (43.25") SETRC2227 £174.00
Loaded Dice 30 EP (47.25") SET3787 £205.00	Vertigo II (55") SETRM11 £186.00
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GLORIOUS CANBERRA

I decided to build this Canberra after reading an article in a back issue and ordered the Chris Golds plan. The maiden was one year later this March. I deviated somewhat to make the model into the USAF version (I was in the USAF, after all).

Power is from Jet Fan 90s running on 8S each, with Castle 120 HV Lite ESCs, a Spektrum 12 channel receiver and mostly Hitec digital servos running on 6V NiMH batteries. The Robart electric landing gear required a bit

more modification of the plan. The plane is covered with Chrome Oracover, dulled down to give a somewhat aluminium finish. It weighs 22.5 lbs and flies very nicely with no

bad habits. Five minutes from brake release and there's about 45% left on the 4 x 7000 mAh batteries.

Greg Minden

PRO-PLAN PLANE

I have been receiving RCM&E magazine and built the Heinkel-like model published in the May 2024 issue.

The model had its maiden flight yesterday and I am very happy with the results. It's slightly heavier than what Colin Baxter achieved but just the same it's a nice, very easy to fly model. I digitised the model's components and laser cut the majority of the parts. I made a few changes and used an easy to purchase 50 mm EDF.

I have included an image of my model in its slightly different colour finish.

Henny Van Teylingen



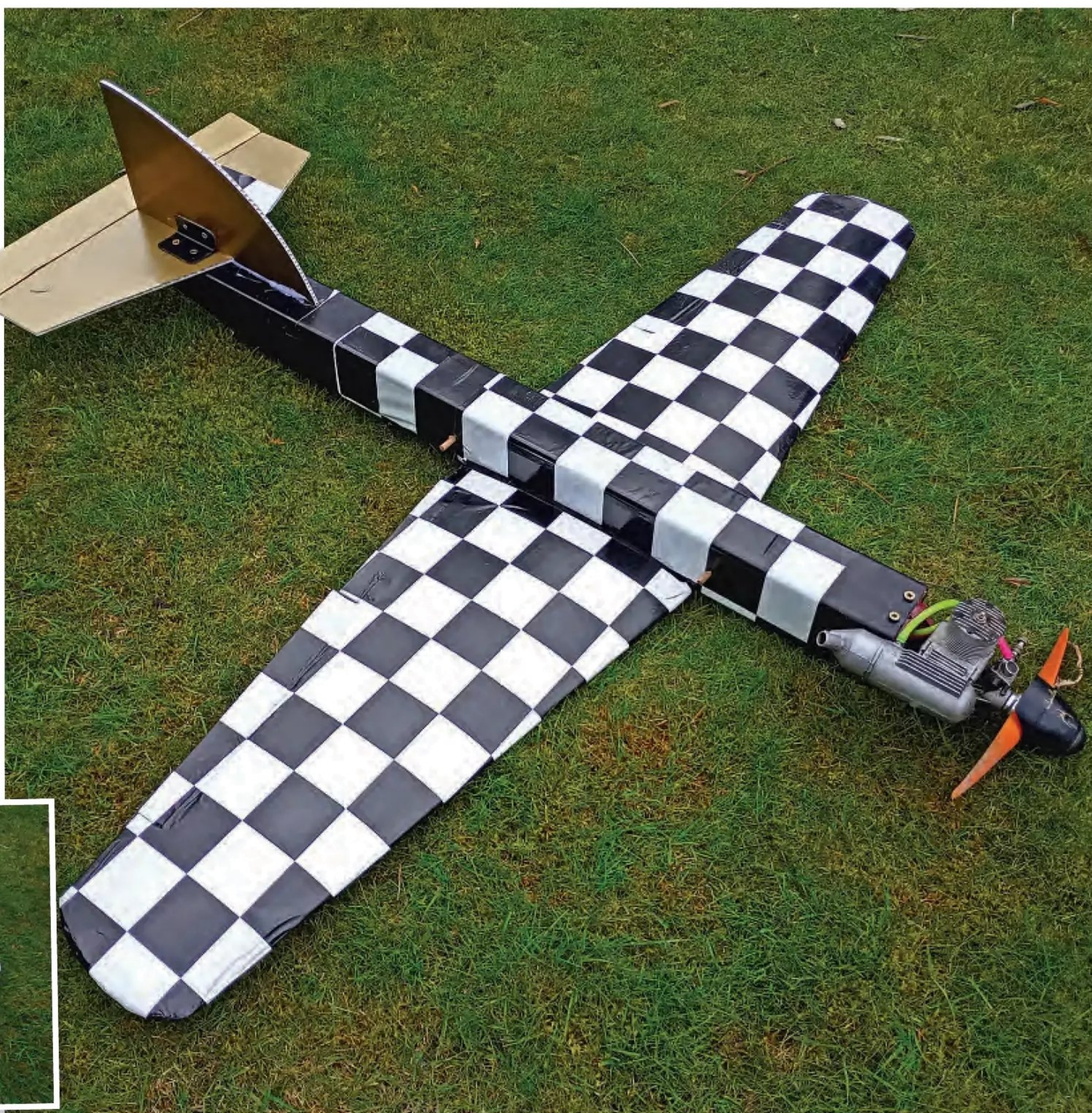
CONCORD RACERS

I am the Vice Chairman of the Concord Model Flying Club based in Kent and later in the year we're holding our first ever pylon racing event. I thought that you might be interested in a couple of pylon racers I've designed for this.

The blue and white one is of all balsa construction with a 34" wingspan. It has an O.S. 15 up front. It only has one aileron to cut down on drag and it's a great little flier. I'm currently building a duplicate which will be electric powered with the same power set up as used in E2K racing.

The black and white one is constructed from the parts bin. The wing is from an old Focke Wulf 190 that I recovered. The tail is made from Correx covered in vinyl wrap and the fuselage is made from a piece of plastic drainpipe. It has an O.S. 40 in the nose. This also flies well but is still being developed. I may fit an SC 46 and reduce the length of the nose by a couple of inches.

Dave Willson



DOPPLEGANGERS!

I have sent you a selection of pictures of our DB Autogyros. Over the winter they have been a club build for members of Northampton Model Aircraft Club. We now have four flying and a fifth in construction*. The model is sold as a kit by DB Sport and

Scale. I am uncertain as to whether David Boddington designed it or simply kitted it, but I do know that it was intended for a .20 two stroke. Ours are all electric powered.

We are finding the models great fun to fly and significantly different from our normal

run of the mill planes - especially when one or both rotors stop rotating under certain (random) conditions!

(*The fifth Autogyro made its maiden flight today, built by John Cross.)

Jeff Barringer



BRIAN'S SONG

Continued from Switch On, page 7:

Lars Helmbro

The first time I met Brian was in 1976 at the World Championship in Borlange, Sweden.

I then learned about his skill in designing scale models and his plans. I built the Harvard from his plans and had great success with that aeroplane. The next of his designs was the Mosquito which I also flew with great success.

With this background with his designs, I have always recommended them for interested modellers. I cannot think of any other designer of model aeroplanes who has had a greater impact than Brian. If built according to his plans you had a model with safe handling and great flying capabilities. Many good results in competitions and on club fields are achieved with his designs.

So, to sum it up. The impact Brian's designs have had on scale modelling in Sweden is huge.

David Law

My journey with Brian Taylor began in 1980, thanks to a friend who ran a local hobby shop here in Melbourne. At that time his plans were very popular in Australia. Known for their light weight,



F4C GB Team proudly showing their trophies.

well-designed structure, with sensible and easy construction methods, they were perfect for an aviation crazy young boy like me.

I was 13 years old when the Brian Taylor plan catalogue quickly became my favourite book. Every night I would lie in bed, scanning through the pages, admiring the models and imagining myself building and flying them. It became a ritual to order a set of plans before each school holiday and spend my three-week term break building a Brian Taylor model.

The first model I built was his 60-inch P-47, followed by the Me

109G, Hellcat, Corsair and many others. Over time I constructed almost all of Brian's models, sometimes even in enlarged versions. Occasionally, I would call him to discuss models and building techniques. Despite being a teenage nobody from Australia, I found him to be very encouraging and obliging. I felt privileged, as if a god had granted me some of his precious time and advice.

My first World Championship was in 1994 in the Netherlands, where I met Brian face-to-face for the first time. I considered myself

extremely fortunate as this was likely the last World Championship he competed in. I had entered with his 81-inch De Havilland Mosquito design and his first words to me were, "Your model is all wrong, you know!" I was a little shocked since it matched my documentation. However, he quickly guided me on how to obtain the right photos for the scheme I had chosen and what the correct colours should have been. On this occasion the Australian scale team was positioned next to the UK team in the model hangar, making it incredibly exciting for me to meet my hero, compare notes and watch him compete.

Brian was undoubtedly the encouragement and foundation of my scale modelling. Over the years, I have applied the techniques learned from his plans to my own scale modelling, which in turn, has now evolved into my own designs. I only wish that young modellers today could experience the joy of building one of his designs as much as I did.

A true legend of our sport and one who had a pivotal role in shaping not only my path, but the path of countless others in this remarkable world of aeromodelling.

Vale Brian Taylor.

Words cannot do justice to the impact Brian had on the scale modelling family, as Pete, Lars, David and many, many scale modellers around the world would attest.

Blue skies, sir.
Danny Fenton



Brian in 1976 at the Scale World Championships in Borlange, Sweden.



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DORNIER DO-24ATT

Join Martin Hardy as he describes the conception, design and build of his latest lightweight multi-engine scale model

Words **Martin Hardy**

Photos **Martin Hardy, Mike Roach, Chris Williams**

About three years ago my attention was drawn to an on-line video showing a stylish three engine flying boat doing a very spectacular 'water loop' at speed whilst performing a touch and go on a lake. This sparked an interest, resulting in the inevitable question, 'Could this aircraft be modelled?' The flying boat in question turned out to be a Dornier Do-24ATT, an internet search revealing an intriguing history.

The Do-24 was designed as a seaplane in the 1930s, originally to replace Dornier Wal flying boats, then operating in the Dutch East Indies. A total of 279 were built. The Do-24ATT variant was built in 1944 as a Do-24T-3 by Aviolanda (Netherlands) and is today the only flying example of its type.

Until 1971 it was used as an air-sea rescue aircraft in Spain before being retired to a museum. It was then retrieved, extensively restored and made flyable. Newly developed, advanced technology trapeze shaped wings with Pratt and Whitney PT6A-45 turboprops were fitted by Dornier, as well as retracting landing gear to make it into an amphibian. Similar wings were also used on the Do-228 feeder liner.

Renamed Do-24ATT in 1983 it later completed a 'round the world' trip to raise money for UNICEF.

MODELLING THE DORNIER

An internet search produced numerous photos, line drawings and videos of the full-size. Plans and kits were less easy to find:

- A full kit for an electric powered model, 'Flying-dutchman-plans/dornier-do24', looked excellent but at 2.7 m span it was way above my pay grade.
- Searches of magazine plans at Sarik Hobbies and Flying Scale Models showed nothing listed.
- AMA Plans Service (USA) listed a 1/12 scale Do-24 of 88" span for IC motors.
- A Graupner kit, also at 88" span was mentioned, but could not be found, so it may no longer be available.

BACKGROUND

I have long dabbled with float planes and seaplanes, from an Ivan Pettigrew (IP) designed Twin Otter which I fitted with floats, to a



Short Sealand which I fitted with own design retracts. I now have an own design Piaggio 136 amphibian and a further IP design, a Short Solent.

WISH LIST

As a prospective model the Dornier was quite an attractive proposition. The design was unusual and rarely seen. It is an amphibian which adds interest, as does the trapeze shaped parasol wing with three slim-line motors. The majority of the wing is parallel chord and no tip floats are required.

The model would need to be usable from both grass and water, electric powered and of a practical size. Ideally, it should have a light wing loading to give good slow flying characteristics and be robust and easy to transport and store.

Finally, the model should incorporate enough scale features to make it easily recognisable.

LES PROBLEMETTES

On the downside, construction would be challenging, with lots of 'problemettes' (I am too old to do 'issues') to overcome and no guarantee of success. I've been there before...

The next sticking point was the size of the wheels in proportion to the rest of the aircraft. It was obviously made for airport runways! So, I needed to tweak the wheel housings to take larger wheels.

Next, the retract drives would need to be waterproof. Solution: use homebuilt slimline mechanical ones.

What about the sponsons? These are the shaped 'winglets' protruding from the fuselage sides to keep the model upright in the water, in place of tip floats. They must also help the fuselage rise up onto the plane during a water take off but not have any adverse effects on handling when airborne. In the case of the ATT they also carry and support the main undercarriage legs. I decided to follow the full-size shape as far as this could be determined from photos etc.

The fuselage underside shape has a large bearing on the model's water handling and even on its ability to take off from water. The full-size has a double step arrangement, probably for a good reason. So, again, I decided to follow the full-size shape. You didn't expect this to be easy!

The connection of the parasol wing to the fuselage would also need sorting. ✈



Martin's Short Sealand on its maiden off water.



Martin with the Dornier Do-24ATT prior to its maiden flight at CMFC.



IP Twin Otter on home-made floats.



Piaggio 136 amphibian.



IP Short Solent.

The struts must be strong and stiff enough to support the wing, whilst providing a conduit for both flight battery to ESC wiring and for receiver to servo connections. The small matter of how to hold the wing precisely in position with respect to the fuselage when fixing the struts could also provide endless 'fun'. I'm always up for a bit of fun!

Last, but not least, after years of trying to build straight fuselages this one looks like a banana. Should be right up my street then!

SCALE FEATURES

Including scale features that are obvious characteristics of the aircraft being modelled really help create the illusion, at least from a distance. Scale features selected to include in the proposed model were identified from photographs and videos on the internet. These included:

- The boat shaped fuselage – very Dornier.
- The size, shape and positions of the struts.
- Engine nacelle, engine exhaust outlets and spinner shapes.
- Wing outline, thin profile, large flaps and very prominent control surface hinges.
- High mounted tailplane with strut supports and twin fins.
- Prominent nose-wheel side opening door.
- Low flying speed. This is a 'fly slowly all day' type of machine, not a whizzy fighter.

PRACTICALITY

Does this aircraft stack up as regard to being a practical model, both to build and fly? In this case the answer is easy, as it has already been accomplished, albeit on a much grander scale.

As a long-time builder of Ivan Pettigrew designs applying the principles used by him on seaplanes would seem a logical starting point. His Mini Catalina has a fine reputation as a model to fly from water and it has certain similarities to the Dornier. It has a high set wing with multiple motors, a complicated shaped fuselage and a high set tail. Ivan's model has a wingspan of 83", a flying weight of 4 lbs. and was originally designed for brushed motors and NiCd batteries.

With three motors the possibility exists to program the outer two for differential control of the throttles. This is very useful (read vital) for taxiing crosswind on water and can also provide some degree of steering on grass with a fixed nose wheel.

An advantage of wing mounted motors is that the slipstream generated by the props flows directly over the wing and provides some lift long before the model achieves flying speed. In practice this means that lower power is required, hence lighter motors and ESCs, as well as a lighter battery and/or increased flight times. Indications were that such a model could operate successfully on three 150W motors fitted with 8" x 6" propellers and drawing in the region of 40 to 45 amps from a single 3S flight battery.

THE PLAN

As is my normal practice I drew up a set of basic plans; initially the fuselage and wings, followed by the tailplane and sponsons. A scale of 1:14 gave a wingspan of 7 ft. and a wing area of just over six square feet. For a model weighing an estimated 8 lbs. this would give an approximate wing loading of 21 oz./sq. ft.

A side view outline of the fuselage was drawn to scale and gave a fuselage length of 1568 mm (approx. 62"). Skinning of 0.8 mm ply was decided on for the side and bottom

surfaces that would come into contact with water – and whatever else was floating in it! The rear of the fuselage above the water line and the top surfaces were to be 1.5 mm balsa. Ply was also used for the front decking and removable cockpit cover areas. These thicknesses were drawn inside the outline to give the internal dimensions of the fuselage.

The outline of the sponsons was estimated from photos and line drawings and added to the drawing. Two-inch diameter undercarriage wheels were drawn, shown in both the retracted and extended positions.

At this stage the position of the Datum (reference) line needed deciding and adding to the drawing. In my case this is normally the horizontal flat top of the fuselage. Back to the 'banana' shape – difficult! The cockpit roof slopes back from the windscreen towards the wing, then there is a shortish horizontal area to just behind the wing, after which it is back to the 'banana'. Got it – for horizontal area read Datum.

The drawing now gave sufficient information to allow the positions of the main formers (or should it be bulkheads) to be determined. These were initially drawn in at locations where the fuselage changed shape and at stress points such as strut attachments. Additional formers were added as required into the spaces between the main formers to support the skins and maintain the shape.

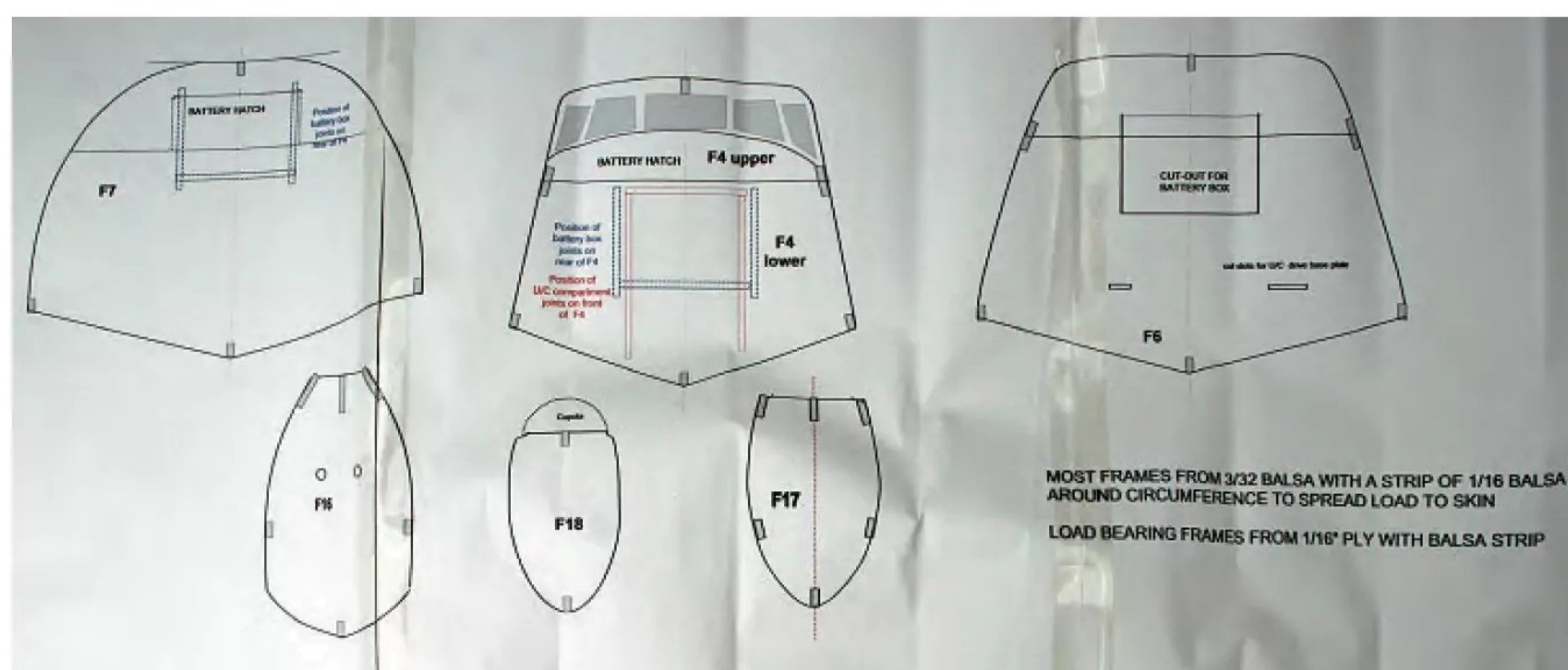
Wing and tailplane positions and incidences were now drawn in, optimised for operation from water. Both the wing and tailplane have a positive incidence.

The fuselage plan view (looking vertically downwards) was drawn above the side view, with a centre line and skinning thicknesses added. The positions of the formers were copied from the side view, so both the width and height of every former could be measured.

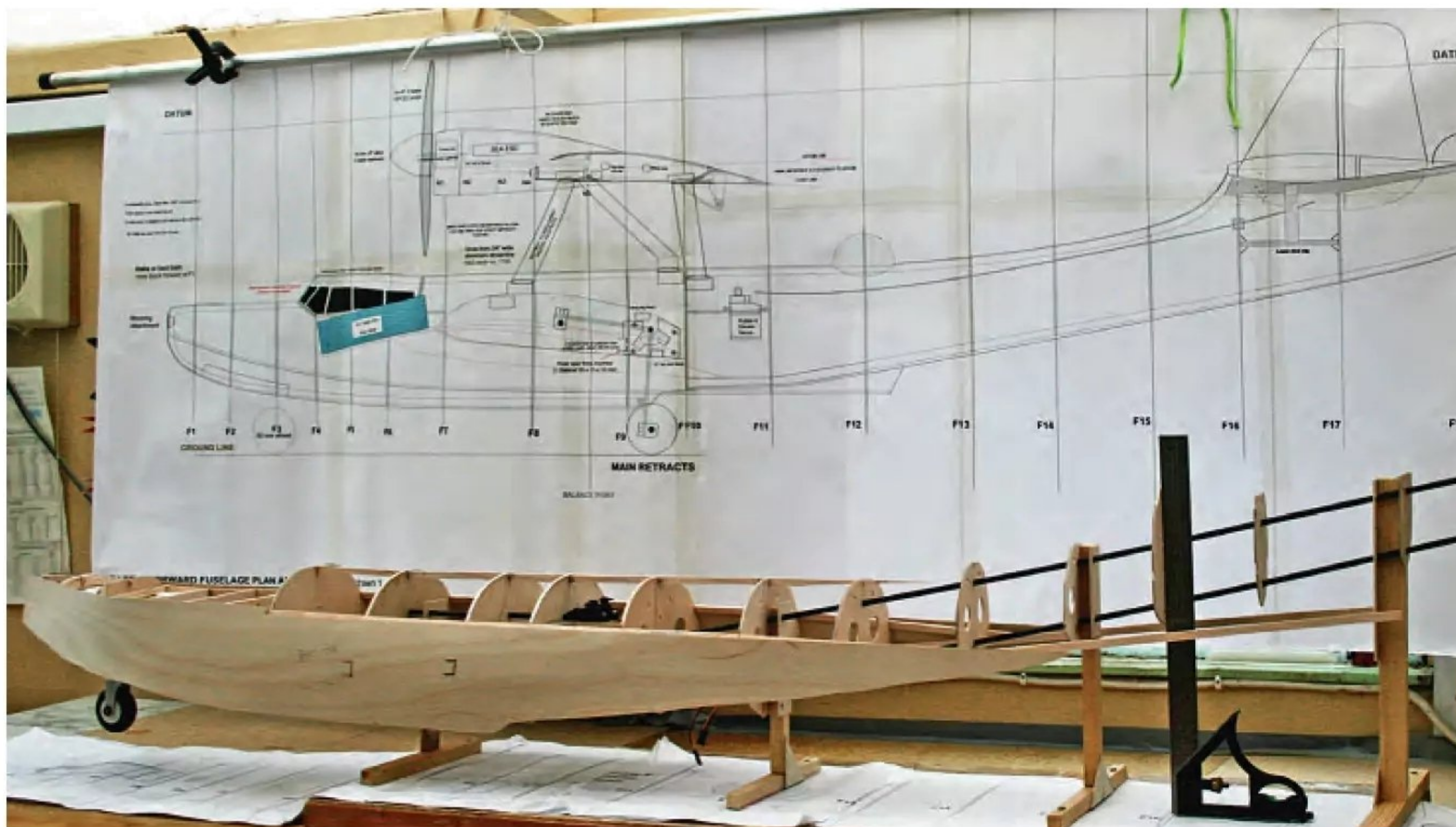
A new 'former shape' drawing was created, initially comprising an outline box for each former using the dimensions from the fuselage plan and including the position of the Datum line. A vertical centre line was added to each box. Photos and line drawings were again used to estimate the shape of one side of each former; this was drawn in on one side, copied and flipped and added to the other side to give a symmetrical shape.

FUSELAGE BUILD

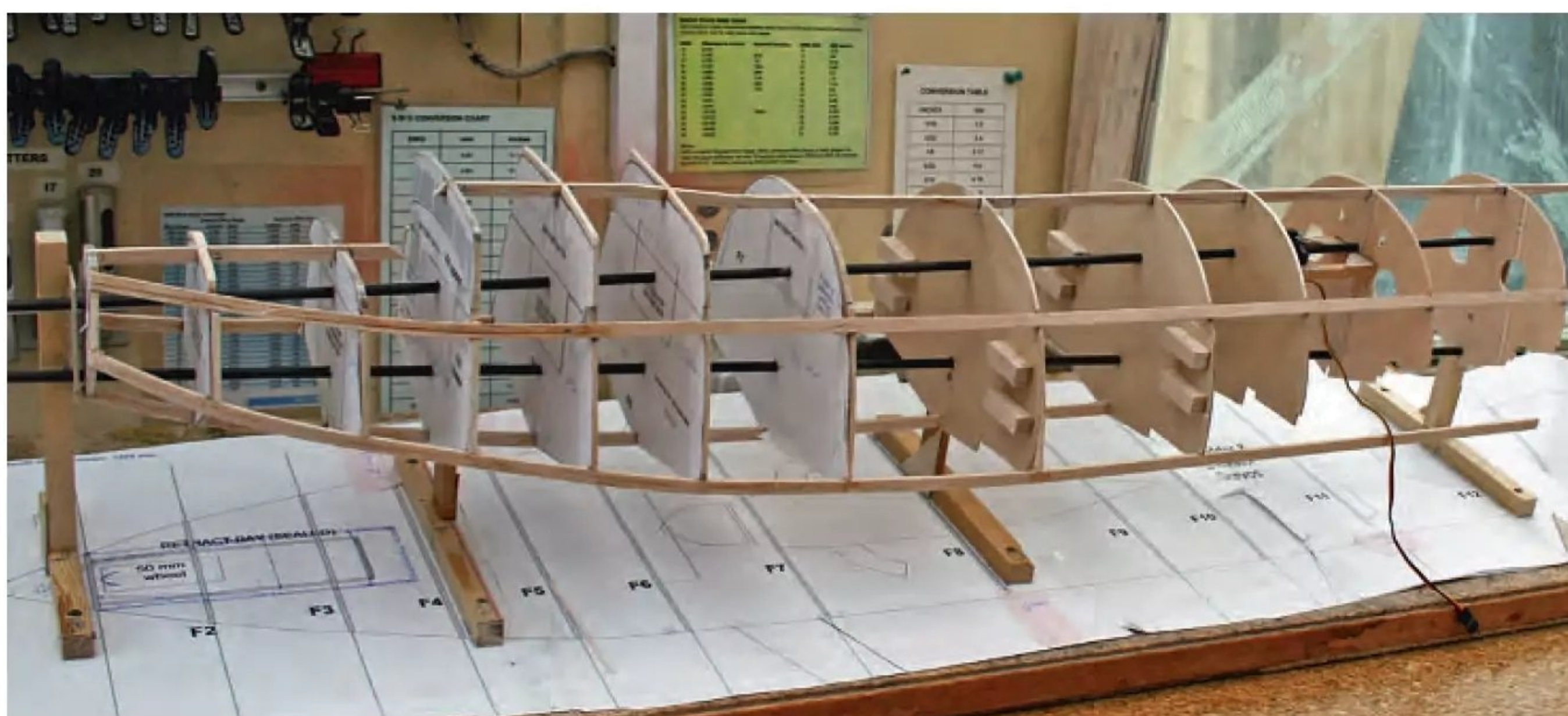
The initial difficulty was to work out a method of holding the fuselage formers accurately in



Example of a former drawing.



Construction showing the rear jig and the basic fuselage plan.

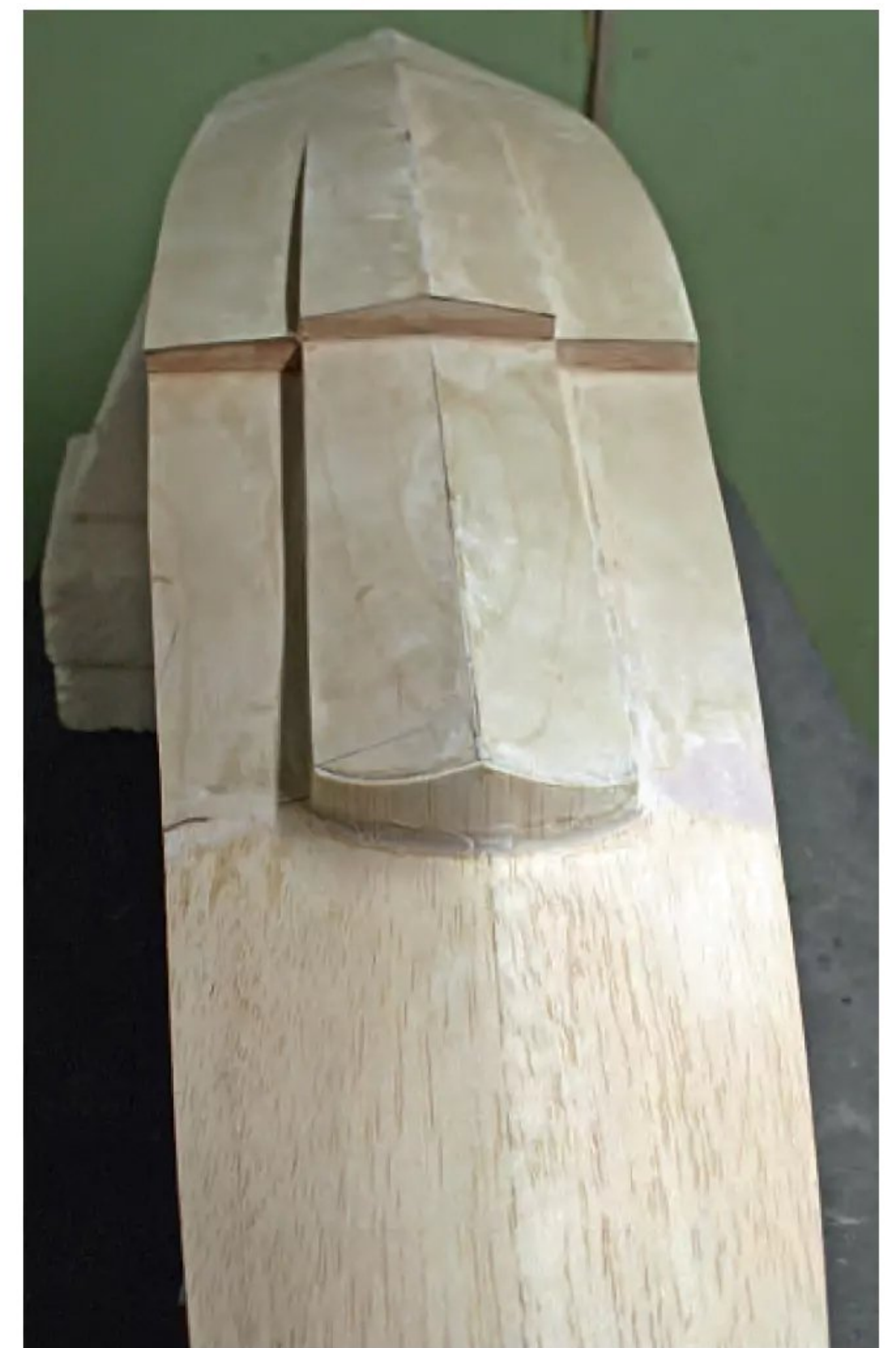


Front fuselage ready for skinning.

position during early skinning, especially in the ply covered areas. The plan view drawing was placed on a building board and inverted 'T' shaped wooden jigs made and screwed to the building board. Formers were held in alignment by carbon rods inserted through holes in the jigs and also on the centre line of each former (see photos).

Due to the length of the fuselage the front half was set up and skinned first. The carbon rods were left in place whilst the rear half was built, using two more carbon rods set at an angle to suit the rear fuselage shape.

The fuselage underside was then skinned in 0.8 mm ply back as far as the second step. The outer grain direction of the ply was set



Fuselage underside showing the double step.

fore and aft. Paper templates were used to ensure both sides were symmetrical. The rear underside was skinned in hard balsa to make the increased curvature easier to produce.

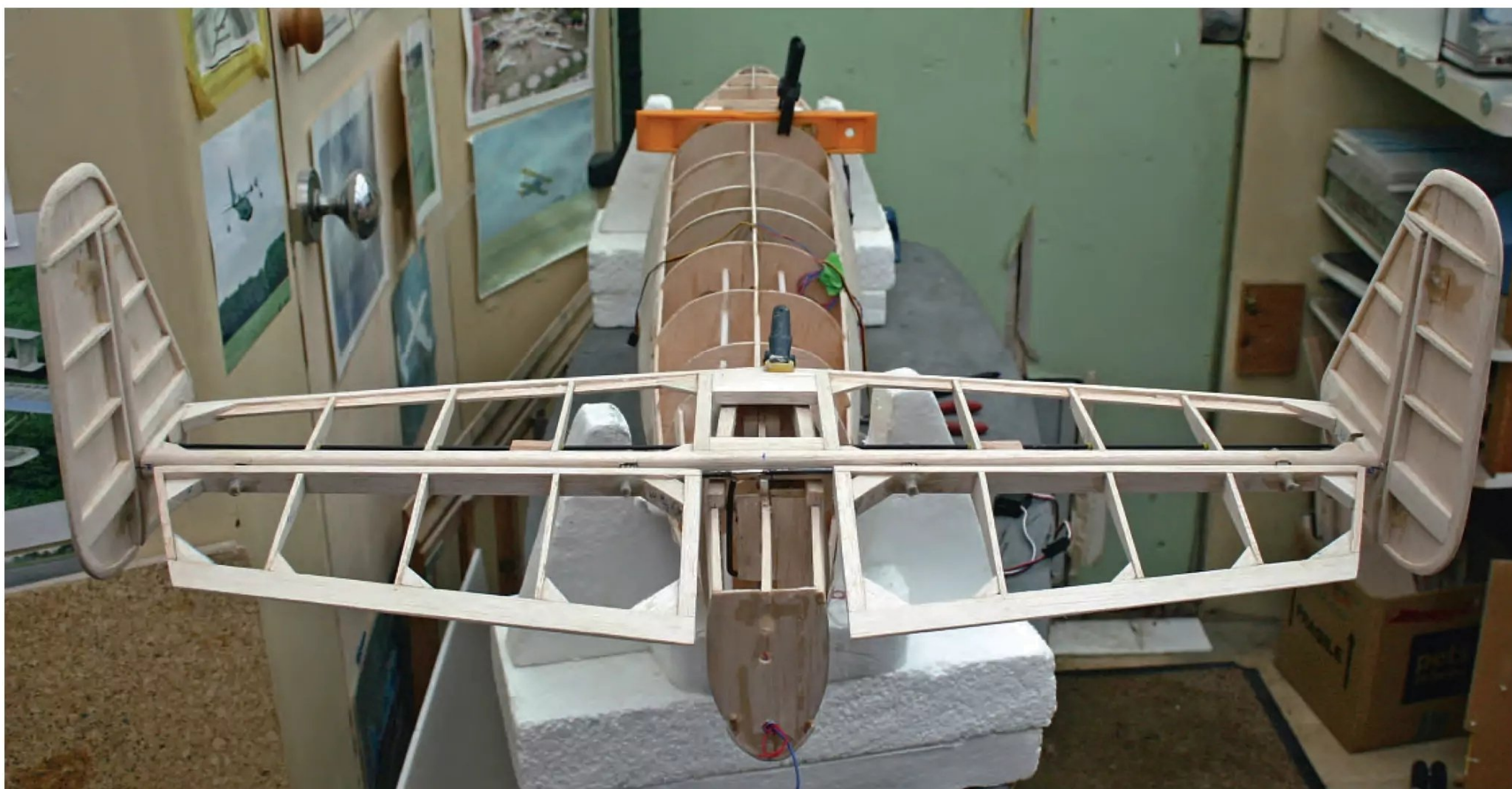
TAILPLANE

The one-piece tailplane is of conventional balsa construction, film covered and with fins and rudders built either side of a balsa sheet core. It is secured to the fuselage with two nylon screws into captive nuts. Controls connect automatically on assembly to the elevator and rudder servos, which are located further forward in the fuselage.

Rudders are coupled together via a carbon rod running through guides in the ribs. Flattened brass tube fittings at each end connect to short wire horns inset into each



It's definitely a 'banana' shape!

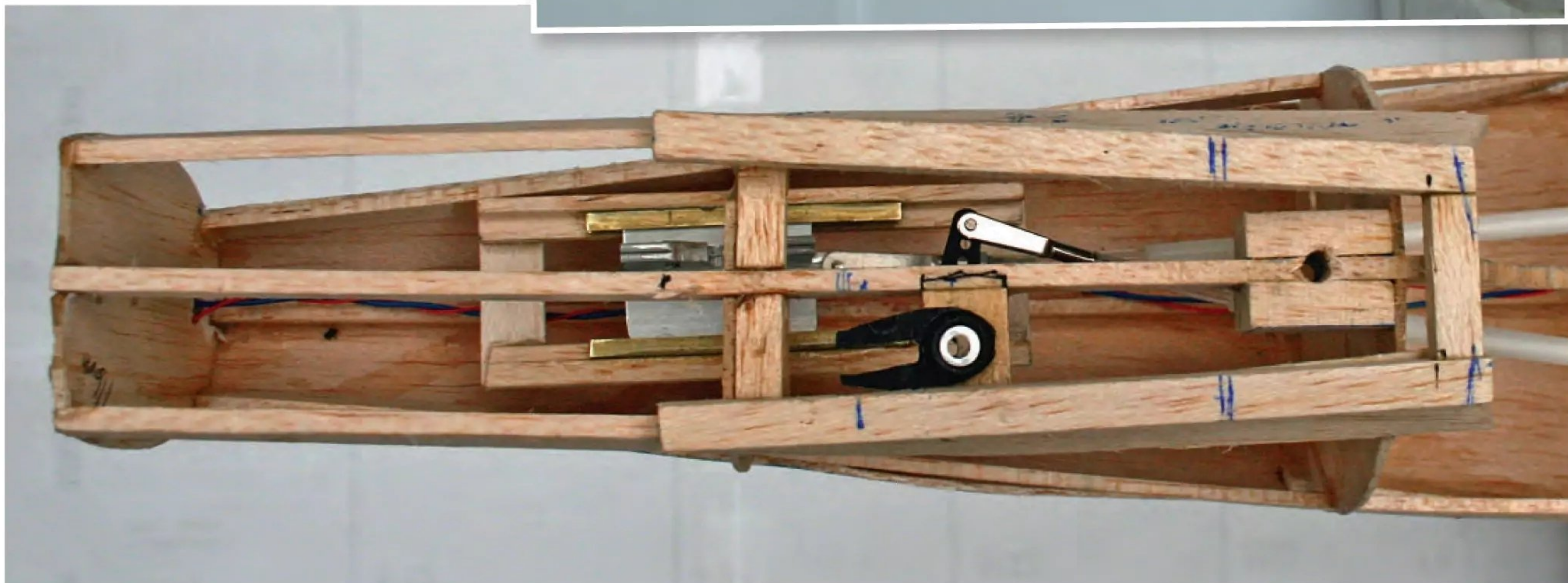


Tailplane assembly.

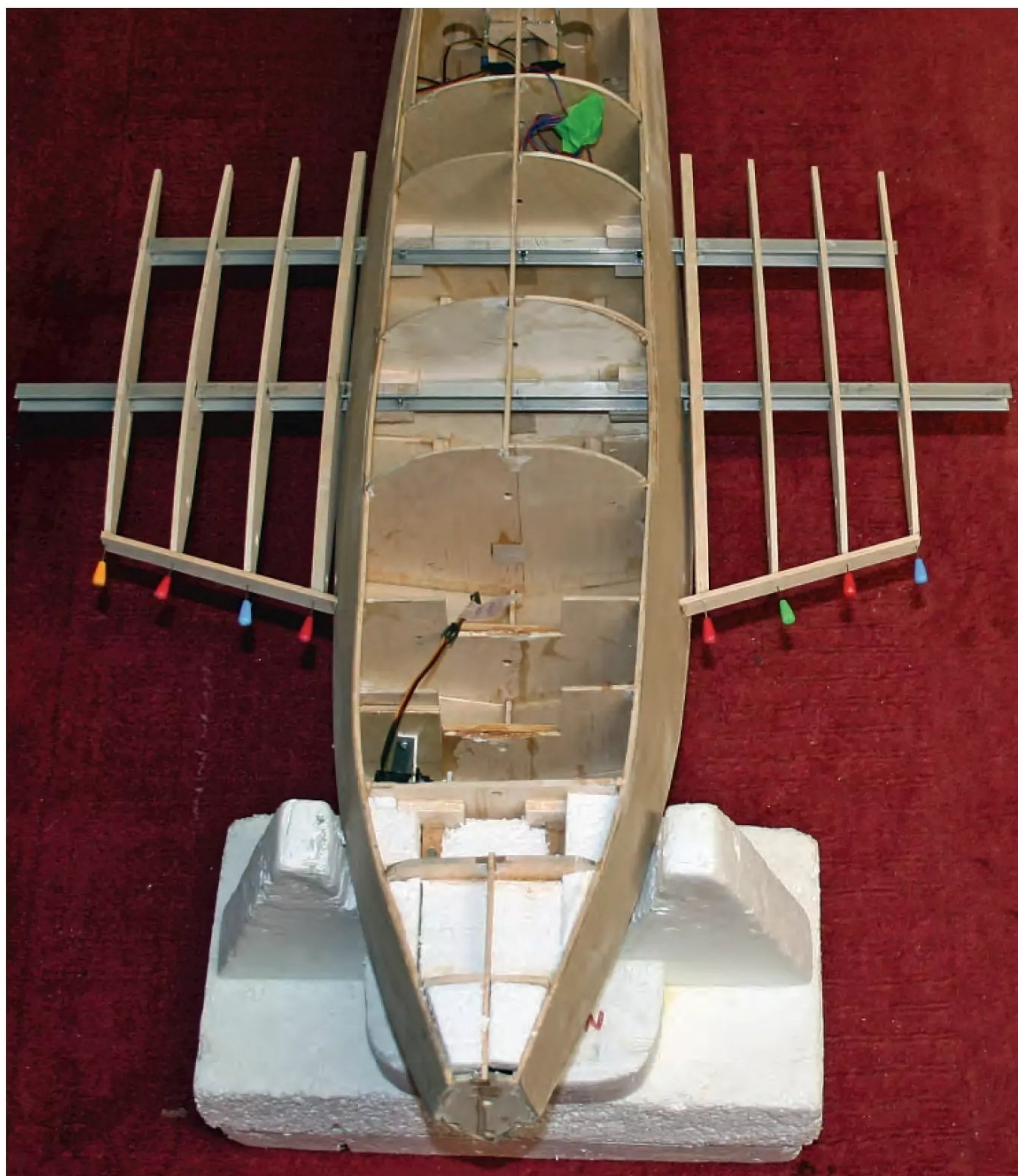
rudder. Near the centre of the carbon rod a brass tube 'T' fitting extends downwards to enter a slotted servo arm in the fuselage. This in turn is connected via a supported tube to a second servo arm and a snake to the rudder servo.

SPONSON BUILD

The sponsons look like miniature wings attached to the fuselage sides under the wing position. They were also used on other Dornier flying boats, including the enormous Do X built in 1929. Sponsons are an alternative to wing tip floats as a method of keeping the wings level on the water. Other advantages include providing a large surface area to aid flotation, lifting the fuselage during a water take-off and, in the case of the Do-24ATT, they also contain fuel tanks and the main undercarriage retracts.



The elevator has a long wire horn which is guided into a narrowing slot in an aluminium slider. The slider is connected to the servo via a snake.



Initial structure showing the 'U' section aluminium spars.



Fuselage to tailplane control linkages. This connection method has been in use for some time now on my Beverley model and has proved easy to use and reliable.



Test fit of the main retract unit.



The Dornier sits ready for its first flight off water. Martin's article concludes in the next issue.

Determining the best shape for the model sponsons was a case of following the full-size dimensions and 'wing' section as far as possible and hoping for the best! Not only did they need to function on water but, very importantly, they should not adversely affect the flying characteristics of the model. What could possibly go wrong?

A separate drawing was made to ensure that in addition to the basic structure there would be sufficient space for the retract units and wheel retraction. Twin 'U' channel aluminium sections were selected for the main spar and retract supports. The channels are supported in the fuselage by balsa blocks and by screws through reinforced ply frames. Main ribs are 1/8" hard balsa and closely spaced, with the outer two ribs forming the retract bay being from 1/8" birch ply. Skinning of the underside is by 0.8 mm birch ply, with 0.4 mm for the more lightly loaded top surface.

Snakes are built in to drive the retract units from servos mounted within the fuselage. Extra stiffness and support for the underside skin is provided by shaped polystyrene blocks glued between the ribs.

To be continued. ■



P-51 and Tony from the new MinimumRC super scale series - with retracts!

MINIMUM MAXIMUMS

John Stennard needs little encouragement to keep his indoor model column going throughout the summer! This time he starts with some small gems from MinimumRC

Words & Photos **John Stennard**

If you enjoy building and flying micro size R/C models you will know the MinimumRC range of micro scale models. These micro models are equally at home outdoors in calm weather.

MinimumRC models are not to be confused with the earlier groundbreaking Kyosho Minium models. Their Minium models were RTF micro size models and came with their own transmitter. They were the forerunners of the micro scale R/C models from E-flite, Ares and several other firms. The Minium models used a 70 mAh 1S LiPo and their excellent performance



The original Kyosho Minium Cessna.



The early Zero and latest 'Q' Hellcat from MinimumRC.



Formation hovering at Alfreton. Challenging fun!

and adaptability influenced our indoor flying activities. Many of our fliers removed the R/C gear from their Minium models and incorporated it in their own designs. We were really spoilt when the R/C receiver units became available as a 'spare part'. These Minium models still occasionally appear on eBay and at club 'Bring & Buy' events.

The current MinimumRC range of models are kits and can be quite complex, requiring careful building. The range of over thirty models is best viewed on the MinimumRC website and the models and other items can be purchased directly from MinimumRC and other sources. The range includes many iconic civil and military aircraft, plus a few obscure ones. The

kits usually come with an 8 mm coreless motor and prop, but the R/C gear is left to the builder. Suitable micro receivers with integral speed controllers are readily available from sources like SWM and Microaces, as are micro 1.7 g servos.

The early models were very simple with a profile fuselage. I am still flying my original 370 mm wingspan and 25 g AUW weight Zero. As the Minimum range of models expanded so did the complexity and the most recent models feature 3D fuselages whilst retaining a simple Jedelsky type wing.

The latest developments from MinimumRC are two new series of fighter aircraft. These are super scale and 'cartoon' scale. The super scale

series includes a P-51, a Ki-61 Tony, a Spitfire and a Stuka, while the 'cartoon' models are a Zero, a Hellcat and a P-40. The super scale range feature retracts! One point to note is that to operate the retracts you require a five channel micro-Rx and Minimum have one available.

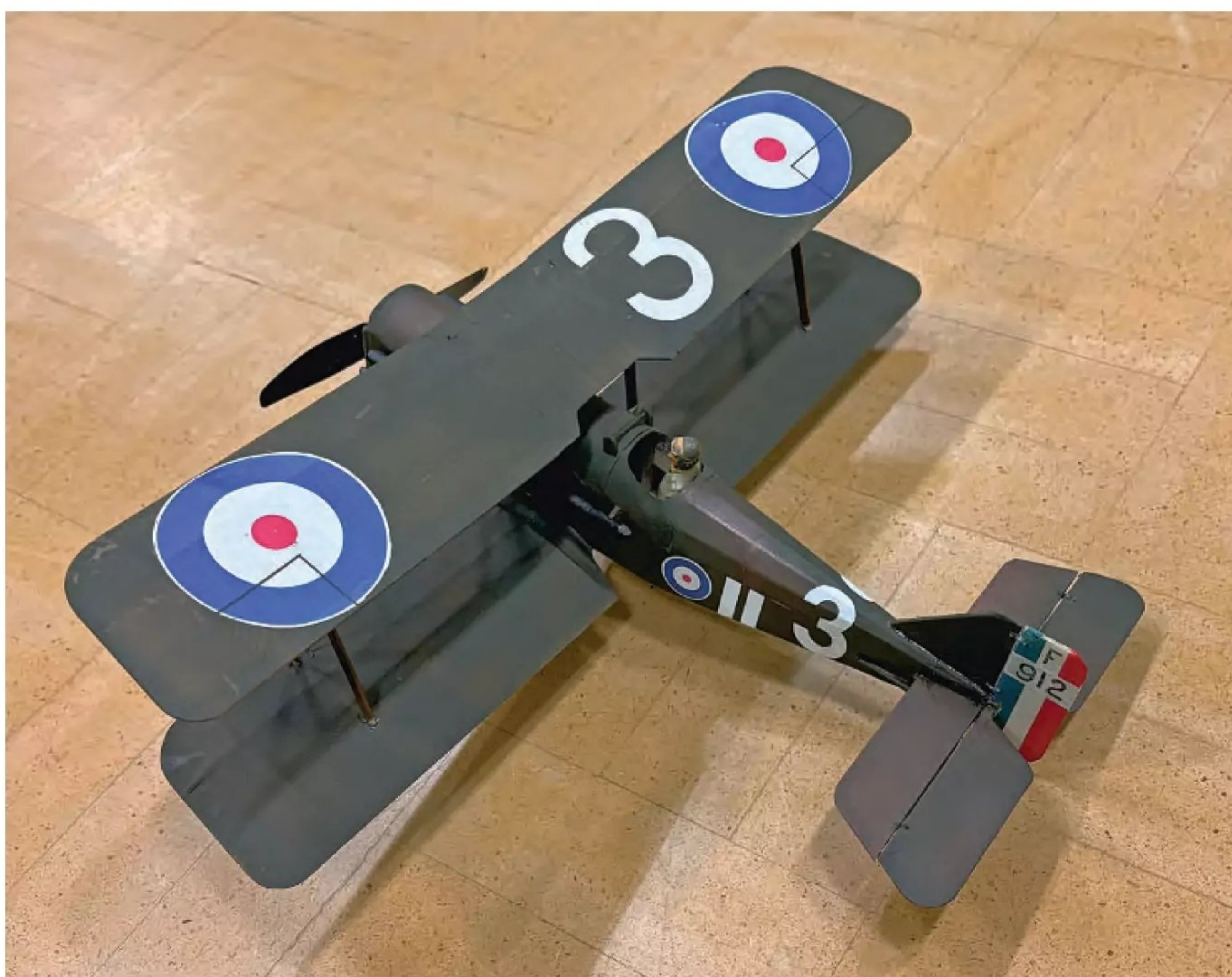
As is common these days the instruction manuals are online. Downloading is easy enough, but do you really want to print out 90 photos with text? If you have the technology, you can just use your phone or tablet to access the manual when you need it.

I've built and flown a P-51, a Ki-61 Tony and a Hellcat and will be taking a closer look at them soon.

INDOOR AEROBATICS

Along with many other clubs our indoor flying programme has either started or will soon be starting and it will continue weekly until around Easter next year. I know some groups keep going throughout the year. Possibly because our flying field was out of action for over four months due to flooding our indoor sessions were very popular with twenty plus members on most occasions. Talking about what's going on, I'm starting with some information from John who is based in the Midlands:

'As a regular and enthusiastic indoor flyer (twice a week in winter and once a week in summer) I'm delighted to see a regular column about indoor flying in RCM&E. I fly at two very active groups up here in the NE Midlands, with several more clubs not far from me. My groups are the Rolls Royce club at Alfreton and the Retford club at Worksop, both in full size sports halls. Clikis are the most popular planes with a few shockies, Vapors, small drones and helis in the mix. Nearby we also have Blue Sky (Chesterfield) and Derby MAC with small venues flying ultralights, drones and small helis, plus a group at Newark who fly in a hall so long they can fly separate groups of fixed wings and helis at the same time, and a new group at Melton Mowbray. So indoor flying is definitely alive and well in our area.'



Peter Smart's lovely SE5a from the Vintage Model Company kit.



This is an R/C conversion from rubber power, so it needed careful initial trimming.

Something we've done a lot at my two clubs is the taking and passing (usually) of the BMFA Indoor Aerobatics (IA) certificates, achievement tests which seem to be almost unknown, even in some established indoor groups. I've visited and spoken to a few other groups and nobody seemed to know anything about these tests. I've been trying to spread the word and wondered if you might like to include something about the IA tests in your column. They're certainly a good test of your ability; the IA A test is closer to the outdoor FW B test and the IA B test is quite advanced - a worthy challenge. Attached is a photo we took at Alfreton.'

It's fantastic to read how active John's area is and there will be more news and info to follow. Regarding the Indoor Aerobatics Certificates, it's worth looking these up on the BMFA website. The aerobatic schedule should not be a problem for any capable pilot who regularly flies an aerobatic model indoors or outdoors. Having said that the manoeuvres have to be performed with precision and even the basic loops and rolls we usually fly can end up being a bit 'untidy'!

Let's not forget that behind every meeting there's an organiser. In our case I handle all the bookings while a stalwart couple, Paul and Sonia, run the two-hour sessions, organising the seven 8-minute slots. They are so well organised that Paul has cards for each of the seven slots; these are hung up on the wall and change in order every week. This may sound a bit over-controlling but with the number of fliers and the variety of models in a four-court hall (badminton courts) it's the best and safest option. At my alternative venue with six to eight fliers in the same size space it's totally different and we operate on a common-sense basis, particularly when free flight rubber models are in the air.

PETER'S PLANES

Peter Smart often attends our alternative venue, less intensive flying sessions which suits his lovely scale models. These can be F/F rubber, CO², electric and even gliders, plus the occasional R/C model.

Recently Peter brought along a really sweet SE5a built from the Vintage Model Company kit. Originally intended for rubber power, Peter had installed a Vapor type module to provide motor, rudder and elevator control. After some quite dramatic attempts at controlled flight, reducing the control movements and including some expo eventually calmed her down enough for a few circuits.



Peter's superb free flight Blohm und Voss 238, built for the Indoor Scale Nationals.

At this point it was decided that it would be best to carry out further tests outdoors. This school venue has adjoining large open green spaces and in calm conditions the SE5a was flown much more successfully. More flights are needed to establish the best setup for comfortable flying.

I have had to assign a few of my indoor models to recycling when they refuse to be tamed and flights were consistently 'hairy', for the want of a better word! Peter is highly thought of in the indoor scale world and the skill and effort required to achieve consistent 'contest' quality flights with his F/F models is true dedication.

Our final sessions saw Peter test gliding his F/F electric powered scale Blohm und Voss 238 flying boat. Power on trials were not possible



One of my models based on a quad. It flew well as plenty of power was available.

"Regarding the Indoor Aerobatics Certificates, it's worth looking these up on the BMFA website"

in our four-court hall and, sadly, fine and calm outdoor conditions were non-existent - plenty of long grass but always wet! So, Peter had to take his new creation to the Scale Indoor Nationals in an untested mode.

A parting gift from Peter at our last indoor session was a really nice Sopwith Triplane. This model just required a new radio refit. More about this model in a future edition.

VTOL FROM BOB

The design, building and flying of most of my 'Quad-Jets' took place during the Covid lockdown when back garden flying became the order of the day. I covered all the experiments and developments in several features. However, I had actually started on this idea some years earlier and was flying one back in 2015. This was a larger model that fitted directly onto a quad; with later models I used quad parts without the original hull. This model flew well and I've included a photo.



Another of Bob's quad based fun aircraft.



Bob's alien space craft, built onto one of his small quads.



The fan housing shows the sophistication of these small EDF models.

“These are quite complex models and feature several lightweight moulded plastic parts”

Several of our club members also built their own versions at the time.

Bob, one of our indoor regulars, has recently been experimenting with some interesting designs that are quite eye-catching. The quads he is using are inexpensive but have a quite limited load lifting capacity so the AUW is critical and good batteries are essential. He has used foam, card, paper and tape for his experimental models and they are really eye catching when flying.

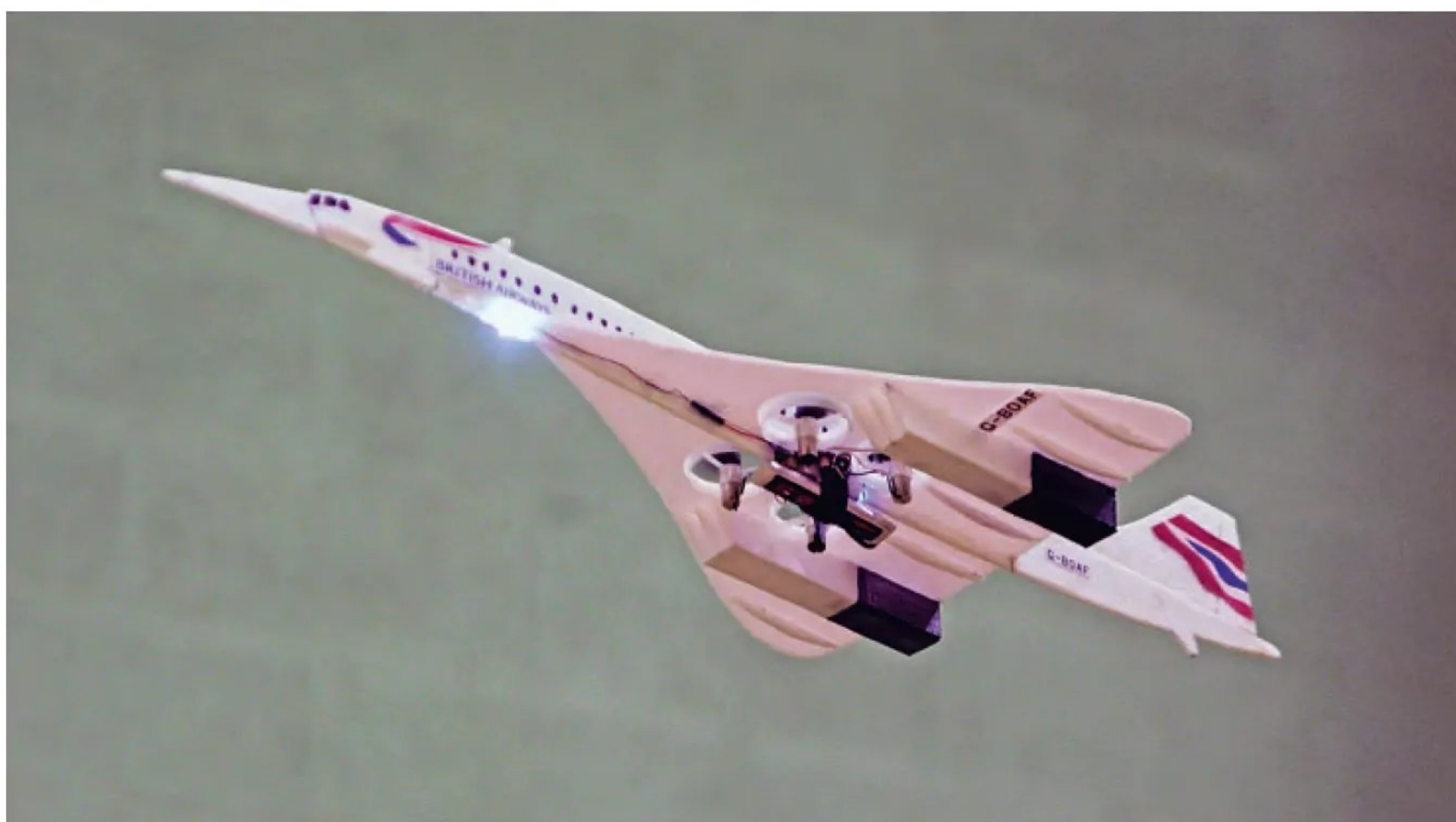
Larger quads that can lift heavier loads, like Bob's type, are relatively inexpensive and I have recently acquired a second hand one. I've been using my smaller quad based Concorde as the finale of our demonstrations at Aerospace Bristol. I like the idea of a bigger version so that will be an upcoming project.

MINIMUM-RC EDF JETS

MinimumRC have had a micro EDF model available for some time. This is the Fan Trainer and it is a quite complex build. With a flying weight of around 30 g, I flew mine successfully both indoors and outdoors.

A new range of 30 mm EDF models is now available and these are definitely outdoor jets, although small and lightweight. The Hawk, for example, weighs 42 g and has a 370 mm wingspan. The models use two 1.7 g rotary servos, a micro 4-channel Rx and a 1S LiPo of 260/380 mAh. The range at the time of writing also includes a F-86 Sabre in the Canadian Golden Eagles livery and a MiG 15. These are quite complex models and feature several lightweight moulded plastic parts in addition to the usual foam construction. Unusually the EDF unit is at the very rear of the model which, of course, requires the 1S LiPo to be right up in the nose.

I built the Hawk and found building it quite challenging; one is working with thin foam and lots of complex bending. These models are not designed for indoor use and when flown outdoors a gentle breeze is helpful.



My Concorde is based on micro quad parts and is appreciated when demonstrated at Aerospace Bristol!



MinimumRC's micro EDF Hawk has a complex construction.



A UMX MiG 15 still flies on at our model field.



My UMx F-16 was a fantastic flier. I wish these models could be revived.



My latest project features R/C No-Cal models with micro actuator radio gear. This is the Prairie Bird.



Yes, it's true! Andrew White's amazing indoor VC10 - wow!

The Hawk flies nicely and handles well but the performance cannot be compared to the UMx micro jets from Horizon Hobby. These used a 2S LiPo pack and, in my time, I flew all of them. I remember that the F-16 flew extremely well; a member of our club is still flying the Mig-15. The only 30 mm fan model available now is the A-10.

NEW PROJECT

With a particular interest in micro size R/C models (4 g is my lightest) I had a light bulb moment. They don't come so often at my age, so I was really pleased as it has opened up a new range of lightweight indoor R/C possibilities.

Watching a delightful F/F rubber powered 'No-Cal' model circulate at an indoor session a light bulb flashed, 'You could fit micro-RC in one of those!' The model is an 8 g flying weight No-Cal version of the Prairie Bird, an American design, and Richard kindly gave me a copy of the plan. This has resulted in a lovely little No-Cal R/C version weighing in at 10 g which flies beautifully.

Normally No-Cal models are scale designs, and the basic requirements are a maximum wingspan of 16 inches and a minimum flying weight of 6 g. They feature a very lightweight balsa strip build and a profile fuselage. I will be writing more about this new venture which caught my imagination - I now have three scale No-Cals flying!

NATIONAL ENDING

I made my first trip to the BMFA Scale Indoor Nationals this year. The event is held in the Walsall Sports Centre at Wolverhampton University. I attended on the Saturday R/C Day, so I did not see any of flying friend Peter Smart's free flight models in action.

As soon as the RC Nationals have finished the F/F modellers change the rectangular hall into two square flying zones. They try to trim their models for a circular flight pattern and can operate two flying zones simultaneously.

What I did see, however, were some totally amazing indoor R/C scale models which flew beautifully, and even spectacularly at times, including a Vulcan and VC10. Yes, really!

Information, news and photos are always welcome from indoor fliers via johnstennard@me.com ■



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The recently completed Allen A-4 resplendent with a top deck finished with doped brown tissue. See 'Wood is Good?'

KEEP ON TRUCKIN'

Dave Goodenough puts a worktop on his field trolley before catching up on another selection of shedly topics

Words & Photos **Dave Goodenough**

I mentioned a while back that as an elder miscreant in this flying game I needed something to lighten the load, so to speak. I'd previously seen several chaps approaching Methuselah's age group using folding garden trucks to trundle their wares down to the Old Warden 'Chuck-n-Duck' flying area from the car parking area. That stirring of 'the little grey cells' saw me purchase one and it's been invaluable. The catcalls of "Where's the kitchen sink?" at my last slope visit were ignored. I was smug in the knowledge that I wasn't the one tripping, slipping and struggling to carry everything in my arms over rough and clarty ground. So, there you are, a very handy device, but why not go a little further...

AIRCRAFT CARRIERS?

No, not the recently blighted 'Big Lizzie' and 'Prince of Wales' floating flat-tops but a simple modification of the aforesaid garden trundle-truck. Some of you out there have bought and regularly use model field stands - why not combine both truck and stand? Not every club provides preparation tables and a great many of us flying machine fettlers find grovelling in the greenery somewhat uncomfortable, if not challenging. Not too much time and effort are needed to make a top with folding clamp-on supports. The parts are in your shed or down at the local wood yard, possibly lurking online too.

My modified model managing platform started life as a 1000 mm x 500 mm section of



Seen everywhere and cheap to buy, the folding garden truck I bought to 'take the load off'.



How many of you still struggle with all this gear and then add models to carry too?



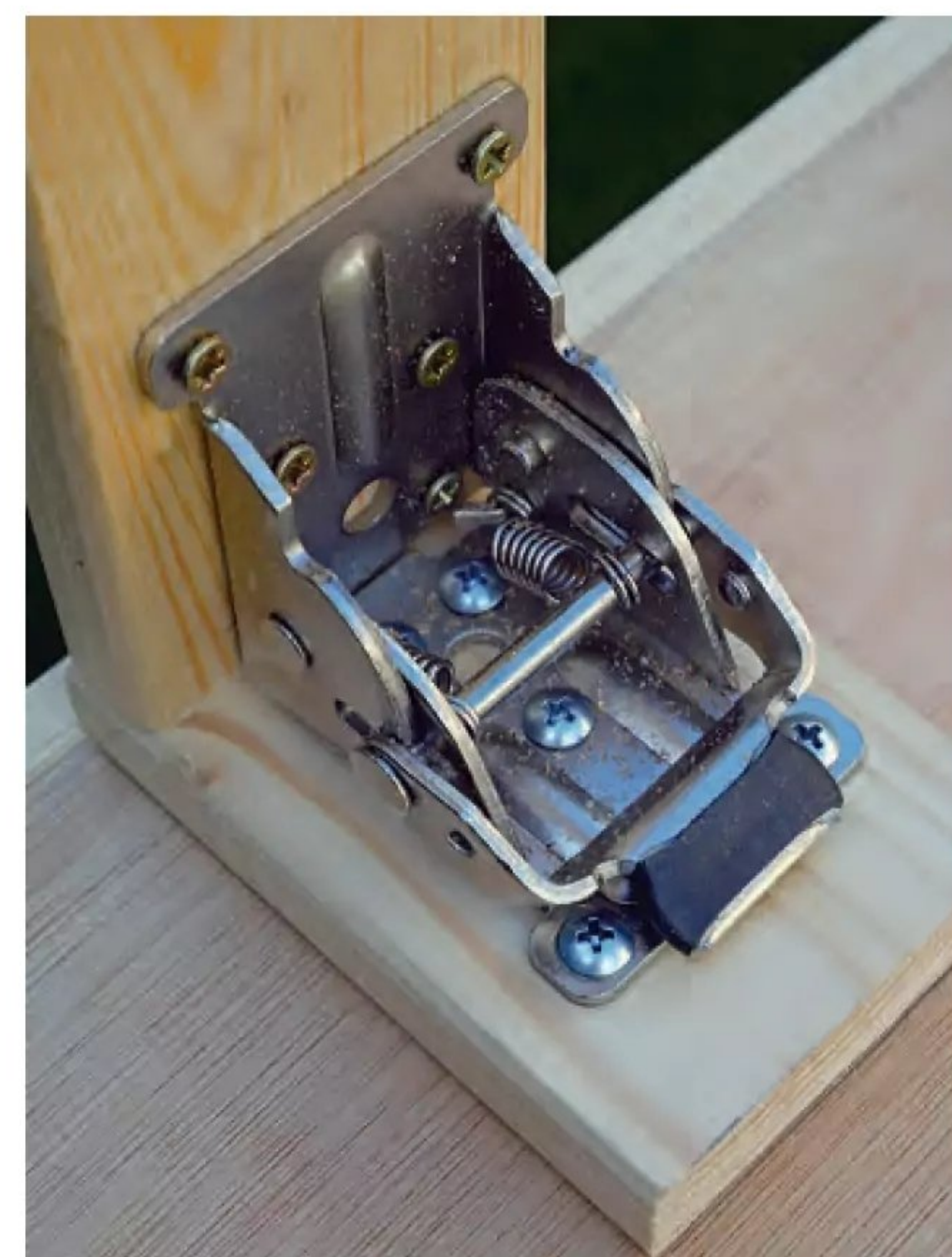
The 'Aircraft Carrier' flat top rests on the truck's upper frame and is clamped by long thumb screws.

9 mm plywood sourced from the 'remnants' stack at the local wood yard. I bought 4 x 90 deg. folding/locking brackets, 4 x knob-ended 6 mm bolts and rummaged in the woodie goodies and spares for 4 x M6 pronged 'Tee' nuts. A scrabble in my son's woodworking pile dredged up some 70 mm x 30 mm section timber of uncertain origin and type, to be rendered unto the folding legs/clamps that would attach to the top loop rails of my trundler. I'll bet you're intrigued now, unless you've looked at the photos. The timber legs were cut to 200 mm long and on one end adapted and drilled to fit snugly over the 15 mm square top rail of the truck frame, with a 30 mm 'U' overhang.

Said overhang was cross-drilled to take the 6 mm knob-ended bolts and M6 'Tee' nuts pressed in and epoxied to one side of the slotted leg. The legs would now drop over the truck top rail, the through-bolts would trap the leg in place and, when tightened, clamp them securely. A bit of nervous measuring, drilling and screwing ensued, ending with four fold-down legs that would locate over the truck rails, clamp tight and now, being tied together under the plywood top, would form a working table at a comfortable height. Later playing with the concept gave demountable fuselage 'U' supports mounted to the top, ✈



The 'Carrier Deck' with legs folded/locked and about to be strapped on.



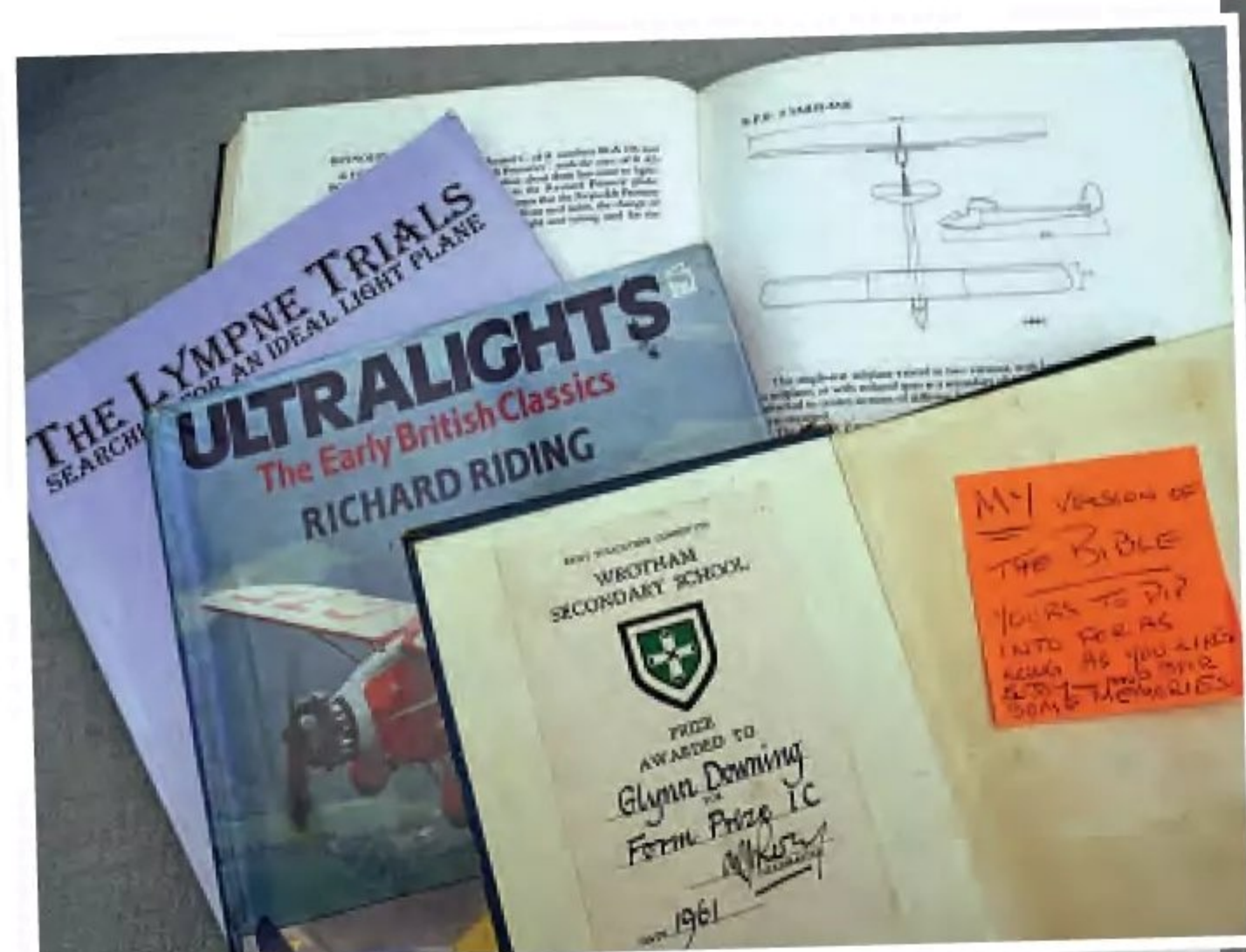
Cheap latching hinges can be found online. Strong and with more uses to be explored.



Truck topper in use. The glider fuselage gives it scale; it's 950 mm long. The overall deck size is 1000 mm x 500 mm.



Detail of the clamp that secures the 'deck' to the truck frame. Easy and quick to make, solid in use.



“Not too much time and effort are needed to make a top with folding clamp-on supports”

but that's where you come in: you modify the basic surface to suit your own needs and requirements. It goes without saying that all the timber parts should be varnished for weatherproofing, just in case.

MAKE A BOOKING

For as long as people have wanted to fly their inventions they've written about their exploits in depth or penned a how-to treatise to 'spread the word' amongst those willing to accept advice. I've picked up such books on occasion and sometimes mates have passed



The source of so much information and knowledge. I love old aviation books.

on their own modelling tomes to me, accepted gratefully and graciously, I hope. You may think that these dusty relics are 'old hat', being as several were produced around the explosion of model building in the 1930s and again in the post-war period of the 50s and 60s, but not so. There remain snippets of golden detail in these repositories of learned knowledge. You just have to wade in and find them.

A parcel arrived at my moorland bothy, sent from the land of Hops and Cobnuts. That'll be Kent to you. Mate Glyn, resident in that fair corner of Blighty, had passed on his personal

school-gifted treasure to me. “Just a long-term loaner”, was mentioned, but as our combined ages have reached one-and-a-half centuries, what's long-term likely to be? No matter: delving into said relic stirred remembrance of my early days, ‘Memories so thick that you have to swat them away like flies!’ That churning of the mind has brought forth reminiscences of past pleasures, successful models built and flown, plus those soul-crushing disasters that seared their place into memory. It's brought forth the intent to resurrect some of the older designs and see

if radio confusion can add a new dimension to the original free flight wandering profiles. You may see them here in the future.

PLUMBER'S MATE?

A few paragraphs ago I mentioned that 'transport of delight', the folding garden truck. My car has a limited amount of boot space, even with the rear seats folded down. With the horizontal area strewn with all my model accoutrements and now further impacted by the addition of said truck, where do I put my models? An old pop song provided the answer: 'The only way is up!'

After several house renovations over the past decades, I've accumulated lots of waste pipe offcuts and fittings. Now we are in our 'final' house, what to do with all those spare 'glue to fit' bits and pieces? Lots of measuring, hacking, gluing, cursing, mopping of fluids (the pipework - glue, me - blood and sweat), brought forth a loop frame on three legs that would sit inside the car boot space like a squat plastic Triffid. It stands above all the other odds-n-sods and provides a safe area to lay the models on top. I made several 4 mm dia. bungee cord loops as gentle restraint lashings, to stop my valuable (?) charges from roaming round the car in normal duck-n-dive road conditions. Nothing has broken yet. I should add that the three legs are not glued in and they remain demountable. This allows the frame to be tucked down the outside of my workshop until it's needed. It can't hurt there, out in the weather; after all, it's waterproof!

BEGINNER'S BUNDLE

Haute Couture?

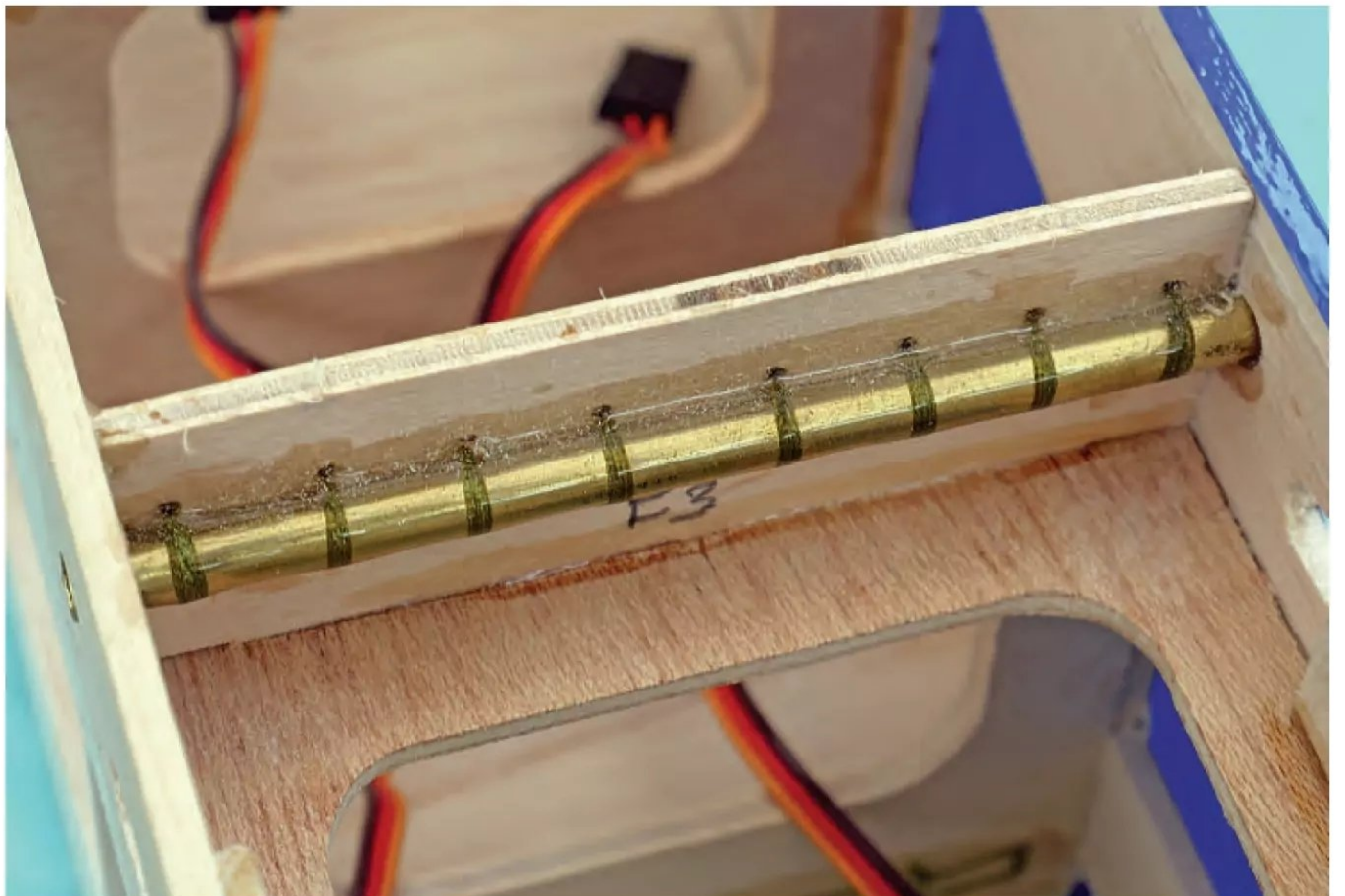
At some point in your developing experience of making your own models you'll come across the art of sewing, although our take on this particular skill is usually limited to securing wires or tubes to fixed components in model structures. Although considered ancient by many it's a very light method of forming rigid attachments. Only the materials have changed a little, all dependant on what you're attempting to hold fast. Yet again, my ongoing Allen A-4 build is a case in point: how to design in, make and secure the several attachments for the wings and tailplane.

When designing both wing mountings, the undercarriage attachment and the all-flying-tailplane pivot, I decided that all would use transverse tubes in the fuselage, secured in place with Dacron thread and epoxy adhesive. However, the epoxy glue was the last page in the chapter, only to be applied when everything was accurately aligned. That may sound both awkward and contradictory, but it really is very simple if a logical approach is used. Wherever a tube was to be mounted on a fuselage former, said component was drilled to take a few sewn loops of 30 lb Dacron thread through each pair of holes. The nearby photo illustrates this. In your mind you've already calculated that the ply component will fail long before the Dacron thread in any disastrous 'arrival'.

Once sewing is completed, don't glue it yet! A tiny amount of movement is needed



Yes, I agree, it's total bodgeneering! This is the demountable model carrying frame that I use in my car. My support gear sits underneath, with all the models resting/bungeed on top. All made from bits of left-over 40 mm plastic plumbing.



Allen main wing support tube sewn and epoxied in place. A tidy job and far stronger than the rest of the model structure.

for final adjustment when the airframe is test assembled. Each transverse tube has a small overhang off the fuselage former, to align the fuselage sides during assembly, yet 'give' just a little to allow a bit of adjustment. With the basic fuselage structure finished the wings and tailplane can be plugged into the transverse tubes and, using that little bit of available wiggle room, tweaked to align them accurately. Once you're happy that the wings and tail are lined up to your version of perfection, a few drips of cyano dotted into a couple of the sewn attachments will stop any inadvertent movement. Remove the wings and tail, then epoxy glue the tubes solidly in place, not forgetting to include the reverse side of the sewn bindings. The result is a

very secure, tidy and lightweight wing and tailplane mount that will only shift if you really 'pile one in'.

HEAVY HANDED

Whilst faffing with the A-4 fuselage structure I accidentally clouted it against the bench, winced a bit and watched as some vertical and cross pieces fell out. Some inventive and derogatory comments followed about some ham-fisted oaf (that'll be me, then) before I began to refit the bits-n-sticks.

Whilst muttering darkly as I went, I remembered my advice from before - gussets! I didn't want any reinforcement to leave a 'witness' behind the eventual covering so I opted to glue the triangular webs 



After self-imposed damage the Allen A-4 sports reinforcing gussets where they won't show through the covering.

“Although considered ancient by many it’s a very light method of forming rigid attachments”

internally, on the transverse and vertical fuselage strips. These small triangular sections of balsa add the tiniest amount of weight yet give support where it’s most needed and don’t show at all on the covered model.

WOOD IS GOOD?

I have a ‘thing’ about Golden Age aircraft, those from the 1920s and 30s where almost anything was tried at least once, not always successfully and many times tragically. A great many one-off light aircraft of wood and linen construction were finished with minimal surface treatment. Plywood was varnished, linen was doped and... well, that was it! If you take a look at some of the Retroplane videos on YouTube, you’ll see many gliders of the period finished in just that fashion. A couple of times I’ve tried to emulate the look on smaller models, but the coloured varnish always looked a bit patchy. So, what to do?

I was fiddling with some very light tissue paper sourced from Free Flight Supplies, brown in colour. Normally I’d be thinking, ‘Why did I buy that?’ and ‘Who would use a dung-coloured finish on a model?’, but not this time. A small test piece of balsa was cut and a patch of said brown tissue doped onto it with my favoured acrylic varnish. Left to dry



When coloured varnish didn’t work too well on balsa, I tried a test piece of brown tissue ‘doped’ on with acrylic varnish. Well, I think it works okay.



The Allen A-4 top deck after finishing with doped brown tissue. It looks like varnished ply, doesn’t it?



Dark varnish over untreated balsa doesn’t look quite right. Not the effect I was looking for, unfortunately.

thoroughly the effect was, to my eyes, exactly right for the finish I was trying to reproduce.

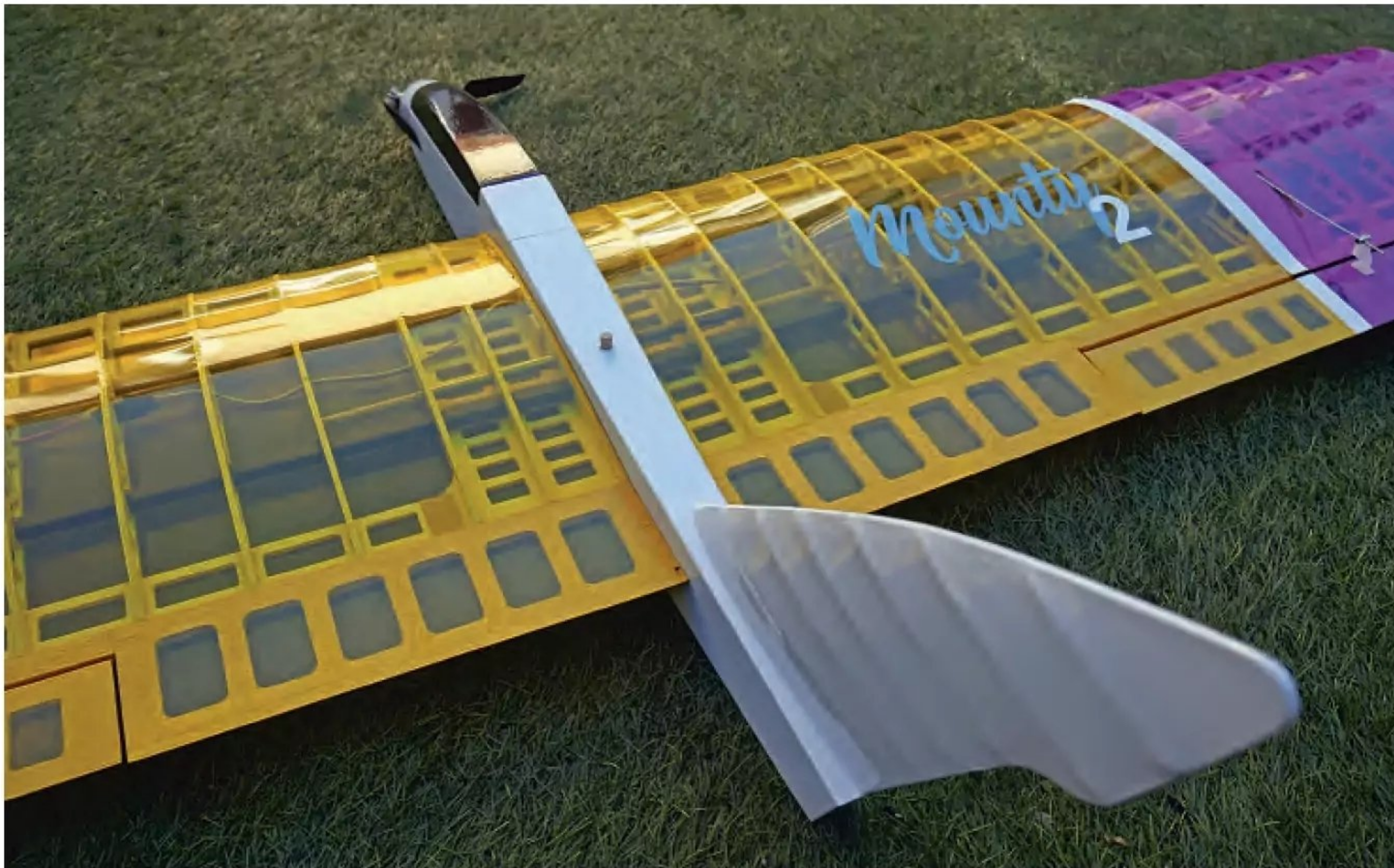
My current ‘in build’ model, being a child of the 1920s, was calling out for a simple colour scheme so I used the doped brown tissue wheeze to fake a varnished ply top deck and cockpit, which form the removable access hatch to the model’s electronics. A patch of ‘silver’ covering film faked the aluminium nose cowl and a pair of ‘engine cylinders’ will be turned from a bit of black acetal plastic rod. That’s something that may be detailed here in the future but it’s a process beyond the scope of a beginner’s basic bench work.

ANOTHER WAY?

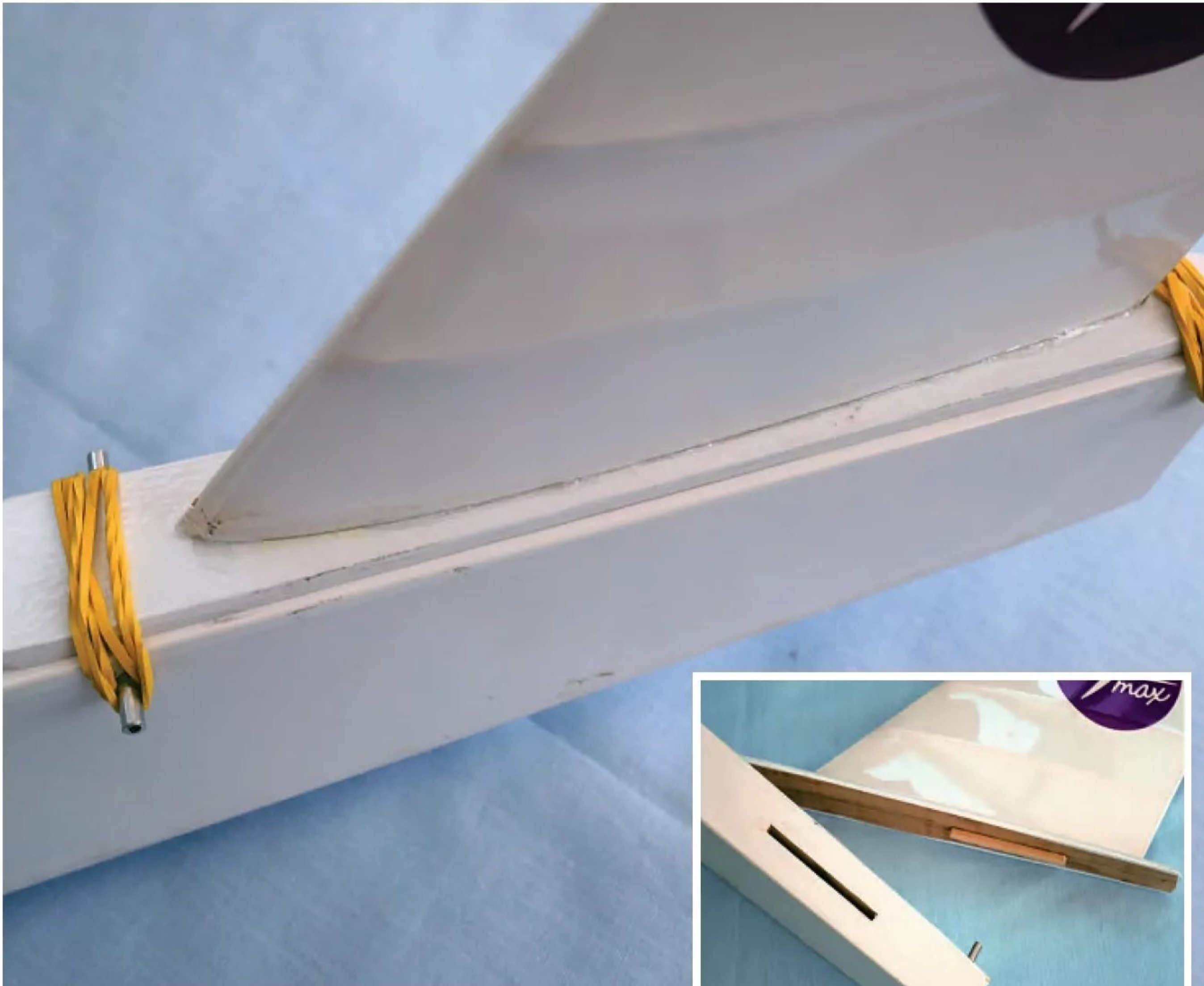
I’ve been test flying a tailless model for possible review from the Wing-Tips site in Austria. Robert Schweissgut produces these very distinctive and eminently flyable models which, despite seeming to be ‘difficult’ are in fact quite suitable as a possible third model build after ‘cutting your teeth’ on training models. The kits are easy to build and have excellent manuals that, despite being printed in German, are easy to follow due to the pictorial content. But testing the ‘Mounty-2’ has shown up a distinct gremlin:



‘Eddie T’ Allen sits ready in his almost finished A-4. I think the overall ‘look’ of a 1920s homebuilt light plane is reproduced. But what do you think?



Mounty 2 is an eminently flyable tailless device, but that fin was my bane when I started flying the model. It kept snapping off!



Okay, it's not all that tidy, but you don't notice it in flight and the fin no longer departs on arrival.

“The result is an accurately aligned fin that will pop off in a torrid landing yet remain undamaged”

anything less than a very good landing can, and often does, snap the plug-in fin off! I've repaired and reinforced mine but still the fin departs.

A bit of lateral thinking was required. Don't try and keep it fixed; if it wants to run away from a landing, let it! The idea was to create a 'breakaway' fixing for this unfortunate but necessary component. Glue a flange to the base of the fin, allowing it to be rubber-banded to the rear fuselage. The base of the flange has a stubby 'key' retained, to align it correctly in the original fuselage slot. The result is an accurately aligned fin that will pop off in a torrid landing yet remain undamaged. Simple! The 'fix' isn't as tidy as I'd like but who will notice it when I'm hooning around the sky enjoying the model?



A problem since testing began. The fin locating tongue kept snapping off in bumpy landings.



Just turned eight, young Herman has mastered the 'Duet' donated by my mate Andy. He was every bit as chuffed as he looked.

TAILSKID

I mentioned a while back that I'd been donated some indoor goodies by a generous clubmate and that I'd passed on most of the models and goods to the chaps that run indoor sessions in the Poynton Leisure Centre sports hall, near Stockport.

One specific recipient of a Flyzone 'Duet' R/C model that needed minimal repair attention was young Herman, a Ukrainian refugee who, along with his mum, is being supported by Julian Grocott, modellista of the parish. With Julian's help, young Herman, just turned eight, has now begun to fly the 'Duet' successfully, taking him beyond the simple 'charge it and fling it' BMFA Centenary Rookie model he was using previously. I know I'm chuffed to see him progress and Andy Gough, the original donor, is as pleased as punch to see the model equipment being used to benefit others, specifically youngsters.

Send me an email: Coetquidan@yahoo.com

USEFUL LINKS

Retroplane video:

<https://www.youtube.com/watch?v=dVsBLCmHuy8&t=646s>

Tailless models:

<https://www.wing-tips.at/Portraet/Modelle/modelle.htm>

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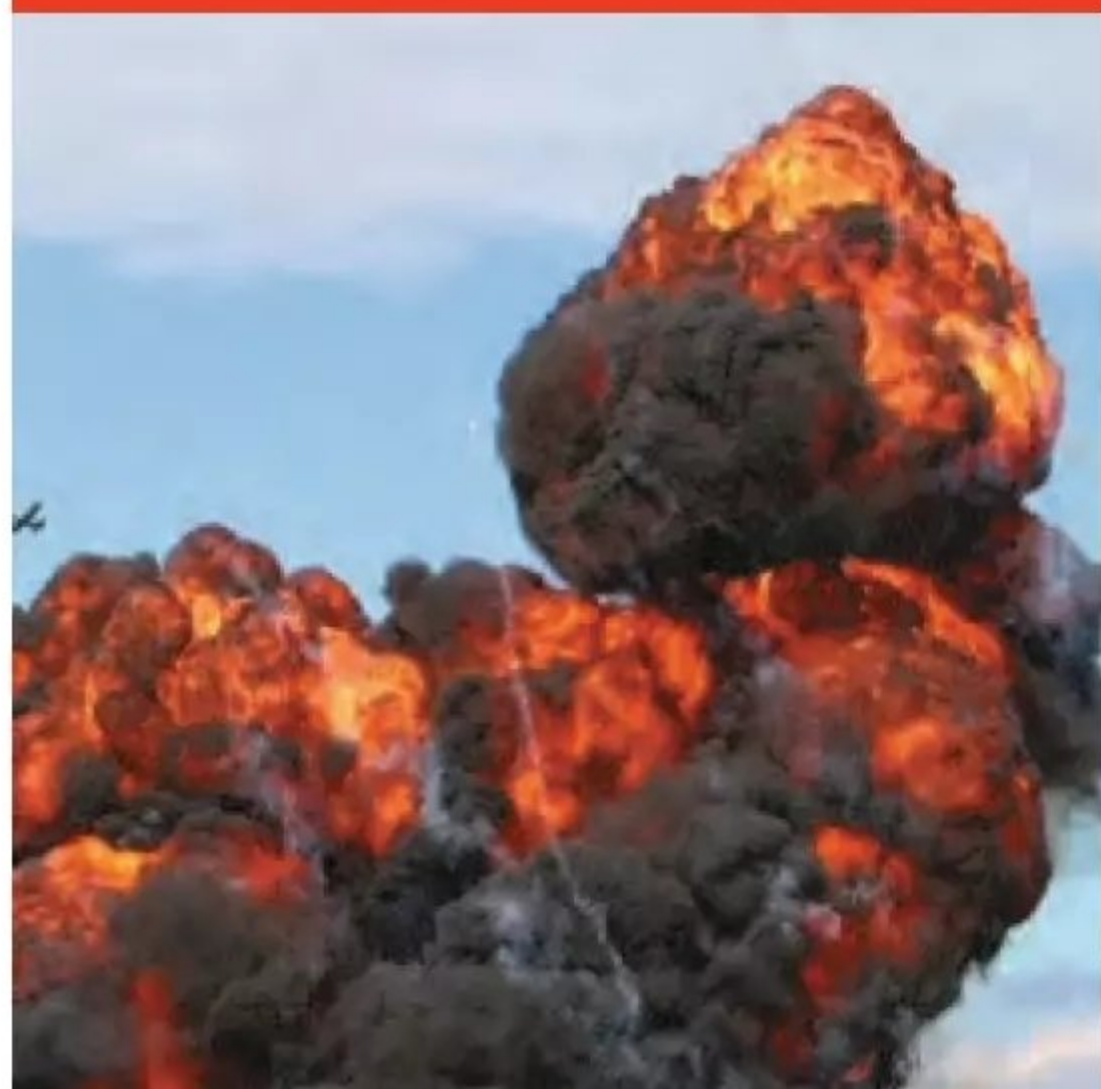
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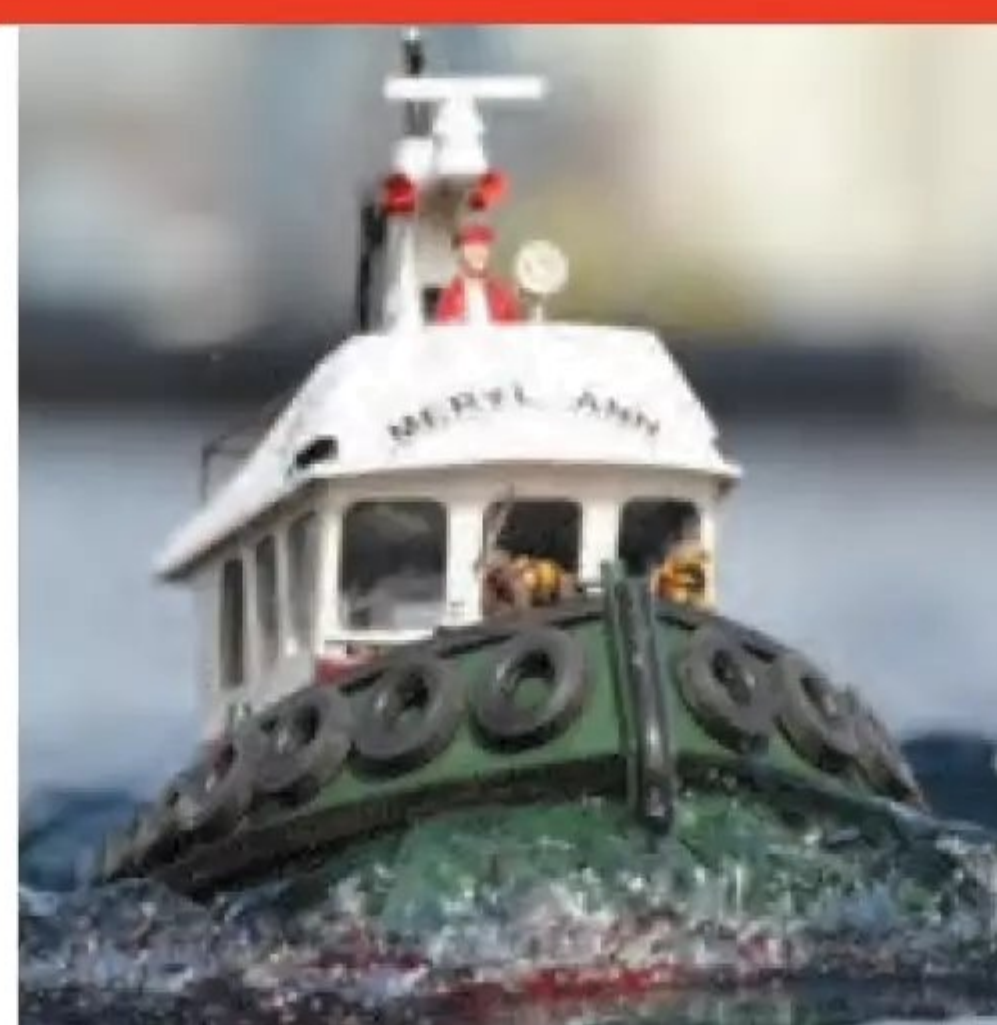
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**KEVIN CROZIER,
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FJ-3 FURY

Ian Perry converts a 1980s ducted fan kit to electric power

Words: **Ian Perry**

Photos: **Ian Perry, Dave Fox**

It's funny how things pop up in our hobby, often out of the blue, my Jet Hangar Hobbies F-86 Sabre being one of those! One day in late 2022, Scott Edwards, secretary of the Buzzard Flying Club, contacted me to say he had an F-86 kit looking for a home. He was selling it on behalf of someone not 'au fait' with selling things online. Scott knows I am into EDF jets so I was his first call.

Popping over to his house, a large and substantial box awaited my attention. A quick look at the plan indicated it was a 1988 design,

but with an updated plan sheet marked as being from 2000. So that put my kit at a minimum of 22 years old!

Following on from my retro review of my Royal Stinson Reliant a couple of years back, the idea of another retro article came about for the JHH F-86 Sabre but with an update to 2023/4 tech. This is a proper builders kit, most definitely not 'plug 'n' play', with an epoxy glass fuselage and foam core wings. The foam cores were not sheeted and needed laminating.

The original design called for a 5-blade

Turbax fan connected to a K&B 7.5 or 8.5 cc two stroke ducted fan glow engine, or possibly an O.S. 46 high revving DF motor with a tuned pipe being extended the length of the efflux tube to make the thing sing. Rhom Air retracts are indicated. It was a highly respected kit in its day and is still used by many jet pilots.

The box was full of Imperial bits and included the Rhom Airs and oleos. There were packets of connectors, screws and pushrods etc. However, most would be unused in my make over as I wanted to use metric parts.



The sea blue, yellow and orange scheme of the Guided Missile Squadron Fury is a welcome change to the silver liveries seen on many F-86 Sabres.



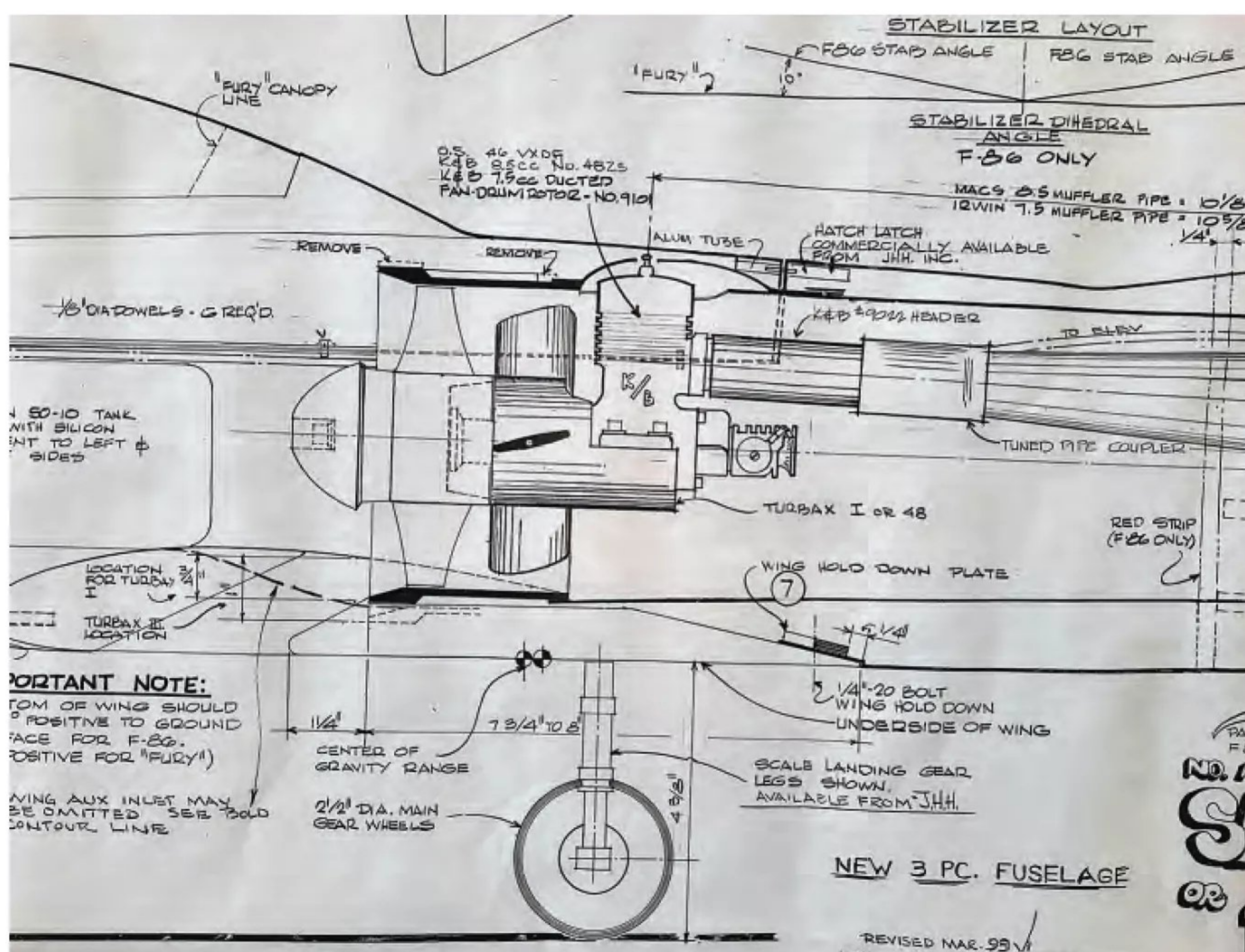
The box came with lots of wood and hardware. Most of the hardware was replaced with metric components.

Dimension wise, she's listed at 50.5 inches in length, with the same wingspan, equating to 1283 mm. This makes her 1/9th scale. The strangest thing is its weight, which is not detailed on the plan or within the instructions. But looking at the JHH website it lists the Sabre at 13.5 pounds. What, for a 50-inch model! I checked this but could not find any better information. More on this in a while.

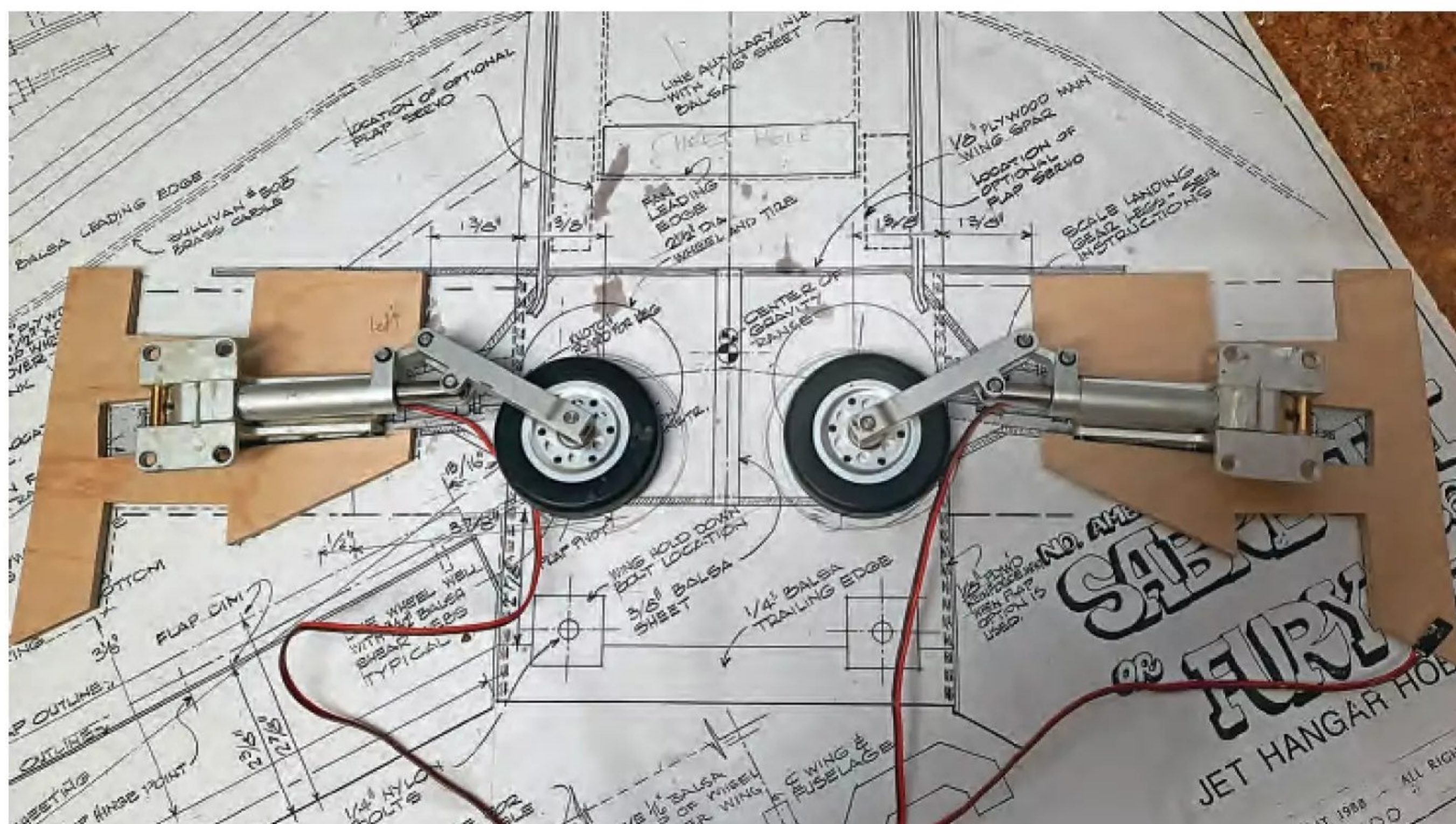
I have always loved the early jet era. One early decision was whether to build an F-86 Sabre or a FJ-3 Fury, both options being drawn on the plans, which are hand drawn across three large sheets.

RESEARCH

Before I started, it was off to my home library to dig out all references to the F-86. Trawling through numerous volumes and internet images, I decided to model the FJ-3 Fury, just to be different. There are several excellent F-86 Sabre kits available, ranging from around 850 mm span all the way up to two metres. Most are marked in Korean war livery, being predominantly silver with yellow wing and tail flashes.



The plan shows a K&B two stroke ducted fan engine fitted with a Turbax fan unit and tuned pipe.



Retracts and oleos aligned over the plan for a test fit. They were later replaced with smaller units.

“In keeping with today’s methods, I elected to use three wing servos to control separate elevators and the rudder”

Looking at the physical differences, the FJ-3 Fury has a different cockpit line, the rudder has two horn balances (Sabre has one), and the stabiliser is set at zero-degree dihedral (Sabre is +10 degrees). Finally, it has a longer nose-leg, resulting in the aircraft sitting with increased positive incidence (+3 degrees). Hopefully, this would help during take-off. Other Fury variants have even more enhancements.

Throughout my build I intended to use ‘recycled’ parts from a previous jet. I had two spare Freewing 1900 kV 90 mm in-runner fans (listed as 4 kg / 8.8 lb static thrust; V2 version), two ZTW 150-amp opto ESCs and a set of trike JP Hobby electric retracts available, plus a handful of wing servos. I’m not saying what I had dismantled to get them, but it was big and triangular...

My next task was to overlay all the bits on the plans to check their dimensions and fit. The original kit used pushrods and snakes from servos located virtually at the nose right down to the tailplane. To me that suggests control slop unless you keep things very secure. In keeping with today’s methods, I elected to use three wing servos to control separate elevators and the rudder.

Coming back to the dreaded weight, I had started to wonder if my Freewing unit had enough ‘oomph’. My Freewing 80 mm Avanti and 90 mm Venom, with in-runner fans, weigh in at around 2.6 kg / 5.7 lb and both will climb vertical from a grass take off. But clearly, they are not 13 pounds! To fix this I undertook lots of research to try to get to a power source to lift that hefty weight, but having checked the

JHH and EDF forums I gave up. To get to that sort of performance I would need 12S LiPo packs and 105 mm or 120 mm fans - too big and too heavy.

Then my brain engaged - get out the digital scales and weigh everything. What a revelation. Every item I intended to use was weighed - kit components, wood, fans, retracts, batteries, even down to a pot of glue! My initial calculations came in at 1.5 kg / 3.3 lb for the actual kit. Add in the servos, ESC, fans etc. and I calculated 3.5 kg / 7.7 lb. Yes, up a bit on the Venom, but further research showed that most EDF warbird jets come in at around +3 kg so clearly it was in the right ballpark and I could uprate to 8S.

I was back on track, so it was time to break open the glue pots and start sanding!

AIRFRAME BUILD

The very first job was to laminate the wings. I cut three lengths of soft 1.5 mm 4-inch balsa sheet roughly to the wing shape. On a dead flat table (an old door) the sheets were butt joined with masking tape. Using the tape as a temporary hinge, aliphatic was run into the joints. The panel was then placed on plastic sheet to stop it sticking to the table and weighed down to keep it flat while the glue dried. Once dry, having peeled the tape off, aliphatic glue was spread on the balsa using a 4-inch foam roller and on one side of the foam wing panel. The foam wing panel was then laid in the original foam core and the balsa panel placed



Wing cores laminated with 1.5 mm soft balsa and with the controls marked up, ready to cut out.

on top, the whole thing then being weighed down whilst drying. Using the original cut foam core ensured that the wing retained the washout as it cured. This approach was used four times to create the upper and lower surfaces.

To create the tail surfaces, ply rib templates supplied were loosely tacked to each end of the balsa stabilisers. This gave the correct aerofoil to sand the substantial blocks of wood to their correct profile using my Proxxon orbital sander. Once completed the surfaces were marked up for the elevators and rudder to be cut out.

I decided to install servos for each control surface. The plan shows pushrods and bell-cranks but that’s not how we do it today! Servos have become smaller, lighter, more powerful and cheaper so I elected to use wing servos throughout. The primary reason for using these servos was, as mentioned before, that I was worried about potential slop from using the original design’s very long pushrods.

The ailerons were marked up, along with the flaps, then cut from each wing panel. This caused another diversion as the kit didn’t include any flap components, although they were marked on the plans.

I then assembled the two wing panels and the centre section by inserting a ply wing brace and epoxying the three sections together whilst building in 37 mm of dihedral on both tips. The centre section was then glassed and epoxied over the joints.



A busy wing underside with slots cut for retract units, wheel wells, and flap and aileron servos. Reinforcement was made with wing spars and glass-fibre laminations.



Homemade nose inlet tube cut to fit the nose-leg retract unit.



Final rear jet tube. The diameter reduces to 85% along the length of the pipe.



Nose retract unit mounted on its ply mount.



Main retract unit being test fitted to the wing.



Holes were cut full depth of the tail for the elevator servos to sit in. They are hidden by a combination of light weight filler and thin balsa sheet.

Having got the wing together it was time to work out where the retracts and servos would be placed. These were marked out, making sure that the flaps were working in unison. The underside of the wing was cut out to take four servos and two retract legs. I used a hot soldering iron to cut the foam, using a good face mask to combat the fumes.

I made my own thrust tubes. I purchased a length of 2 mm polyester core mat. I marked up a 100 mm plastic pipe, wrapped it with cling film and then oiled over that. After cutting the mat to size it was wrapped around the pipe, using cyano to hold it together. I then used my laminating epoxy to set it to shape. This was all experimental as most forums suggest using mylar sheets.

I was unhappy with the first front intake tube, being too heavy at 220 grams - too much epoxy. I made another tube at half the weight; much better. I then made the much longer and tapered rear thrust tube, weighing 194 g, reducing it from 101 mm intake diameter to 85 mm to increase fan efflux. This conformed to the Fan Swept Area (FSA) target range.

I built the wing using 'pre-used' retracts but I found that the oleos were too long at 100 mm, despite installing 'as per' the wing plan view, creating a nose down attitude. Looking at the side view plan, I realised the legs are substantially shorter. Lots of ruler time indicated that I needed two new opposite action retract units and, believe it or not, the shorter, lightweight 80 mm oleos that came with the kit. I wondered why they were in the kit! With a ply block inserted under the nose leg, I achieved the +3 degrees needed for a Fury, but I should have spotted the disparity on the plans earlier. I upgraded the oleo springs as the originals were very lightweight and too soft, offering virtually no compression.

At the tail end all the servos are fully embedded in the balsa tailplane sheets. Having positioned the servos, I drew around them, then cut out the balsa, enabling the servo to fully sit within the tail and fin. Each servo was top and tailed with very thin ply, creating a good surface to cover in glass cloth. Spot the servos in the pictures, if you can!

ADDING CHARACTER

A large wing fence and three small leading-edge fences were added to the wing. The Fury had been upgraded from 50 calibre machine guns to cannons. I replicated this and fitted drop tanks by purchasing Freewing F-86 spares. The three gun-ports were cut down and positioned to represent the two cannons. The wing tank pylons were attached with foam glue. The tanks can be attached or removed for flight as they are held on by magnets. The version of Fury I had chosen to model was used to control drones!

She comes to life using my Futaba T16LZ. I had chosen to use an Opto ESC so I would be using a 2S 6V LiPo for the receiver and servos, using telemetry to see the state of the radio battery. I used low profile digital wing servos throughout, except for a standard servo for the 'pull-pull' nose leg steering.

FURY FINISH

With all the key items in place it was time to start making her look pretty. Looking at my two Fury books and, specifically, the FJ-3, I quickly decided upon the sea blue, yellow and orange scheme of the Guided Missile Squadron based at NAS Jacksonville. She's different from many Sabres and should stand out well against both blue and grey skies. Pyramid Models created the vinyl markings.

Although the kit came with a clear canopy, I decided to paint the glass hatch and canopy as there is not enough room for a nice pilot.

NEW TECHNIQUES

Despite years of scratch building, my Fury build required me to try some new techniques, the major one being glassing the wings. Why have I shied away from this? It was far easier than I thought. Laying toilet paper on the glassed wings, I let it absorb the excess resin. Then, working from the tip to centre, rolling the paper up proved key and helped create a good finish. However, once primer was applied, I did notice some unfilled weave. These areas were filled with ultra-light filler and sanded back.



Undressed airframe completed and looking right. Cannon ports and wing fences add to the character.

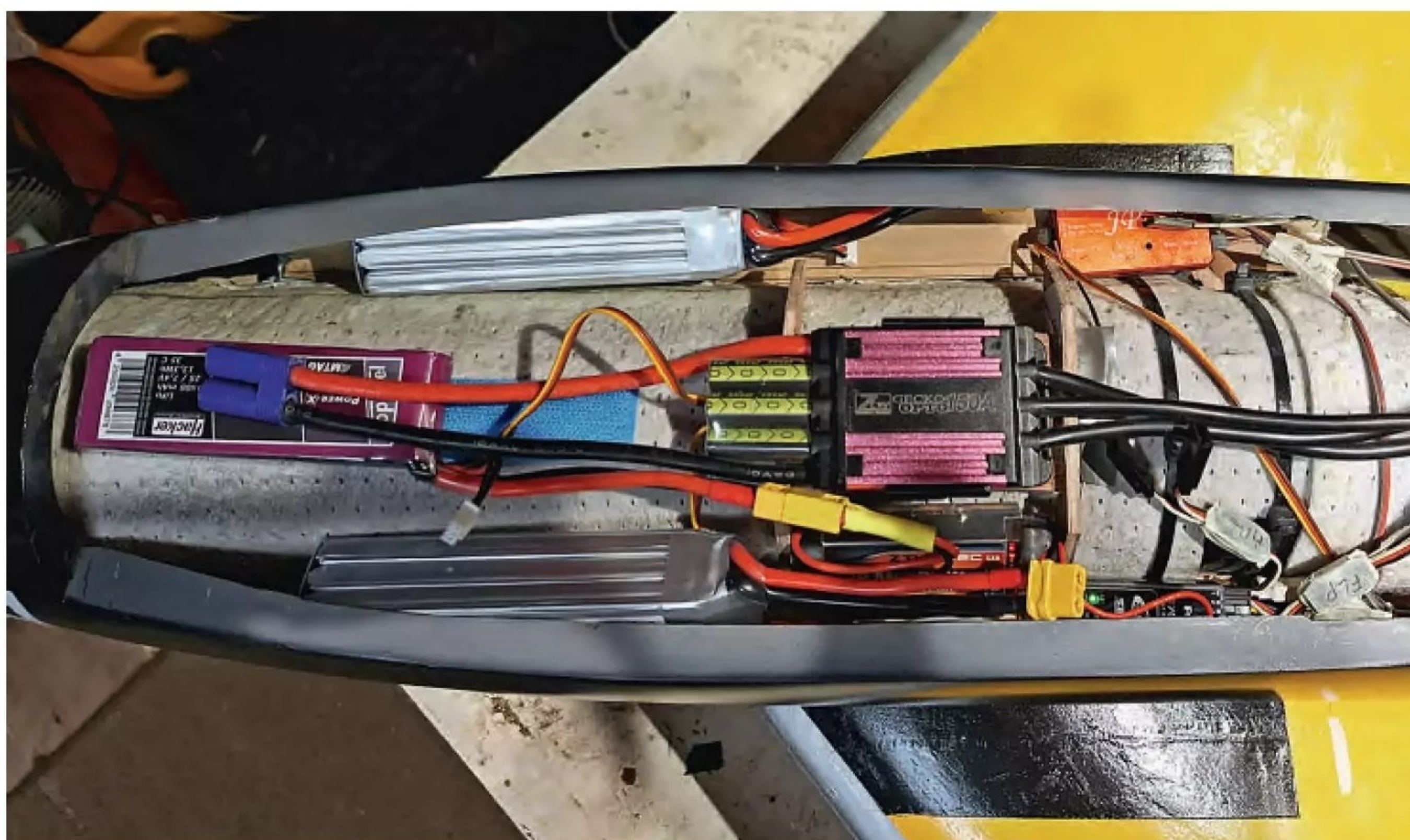


Lamination process underway, with toilet roll being used to soak up excess resin. The paper was rolled from the wing tip to the centre, absorbing resin along the way.

“...my Fury build required me to try some new techniques, the major one being glassing the wings. It was far easier than I thought”



Painted, marked up and sitting on the bench awaiting final flight control set up.



Busy internals with a 2S LiPo powering the receiver and servos. The fan is powered by two 3S 5500 LiPos in series, creating a 6S pack. Other items include the 150A Opto ESC (non-BEC) and a JP retract controller, all sitting on or around the intake tube. It was tidied up a bit for flying.

I airbrushed the model with Humbrol enamel using my Iwata airbrush, the paint being thinned around 60:40 paint/thinner to facilitate ease of spraying. Two tinlets provided enough paint for two coats on the top wing and the tailplane - airbrushing uses very little paint! Further painting still showed some weave, so I had another filler session to get the surface to an acceptable level.

Creating the thrust tubes used another different approach. When the laminating epoxy was used sparingly the core mat made for a strong yet lightweight tube.

I have never fully embedded servos in solid sheet before. This worked well, with the servos being hard to spot. At our club 'Show & Tell' night, members could not believe the servos were in the tail and had to check for the protruding horns!

The two nose cannon apertures were adapted from a Freewing F-86 three machine gun housing and look right.

I enhanced the model by creating flaps. Those 'barn doors' slow things up on landing and help with those all-important three-point touchdowns. I used an XT60 series cable, enabling me to use 2 x 3S 5500 LiPos sitting either side of the intake tube, there being no room for a single chunky 6S.



Flaps were drawn up and added during construction.



A little aggressive looking from the nose? Note the two air intakes at the bottom of the windscreen.



I was gobsmacked when I saw Dave's photos with FOD rising from the left leg. There must have been an animal scrape on the strip.



The colour scheme really pops and works very well in flight. After a few trim tweaks she was sweet to fly and surprisingly slippery.



On finals after a very successful first flight. She looks the part, don't you think?

Weighing the components prior to building was a good idea. When weighed without flight batteries she was exactly on the target calculated many weeks earlier. Most pleasing!

FURY'S FIRST FLIGHT

Some nine months drifted by before I could test fly her at the well mown Baldock strip. My local club strip is not long enough for many EDFs and the Fury does have small wheels, compounding things. Despite performing a full pre-flight check the day before, I lost a flap to a dodgy Y-lead. Replacing it, we were ready to go.

On the first attempt, she did not rotate. Cutting the throttle, I taxied back to the pits. After topping

off the LiPos the second attempt went well, having slid the packs backwards to obtain a more rearward C of G. Interestingly, there is a great shot of the left leg hitting some FOD on the strip. I did not notice it when taking off!

Trim changes were needed on elevator as she was climbing but after a couple of clicks on aileron she was then flying very nicely. She really looked the part during flypasts and I could not avoid making the odd smile. The transmitter timer was set for 3.5 minutes, after which I lined her up for a smooth three pointer, followed by a long roll out. A quick check of the LiPos indicated 26% remaining on both packs - just right.

My thanks go to Dave Fox for the flying shots. ■

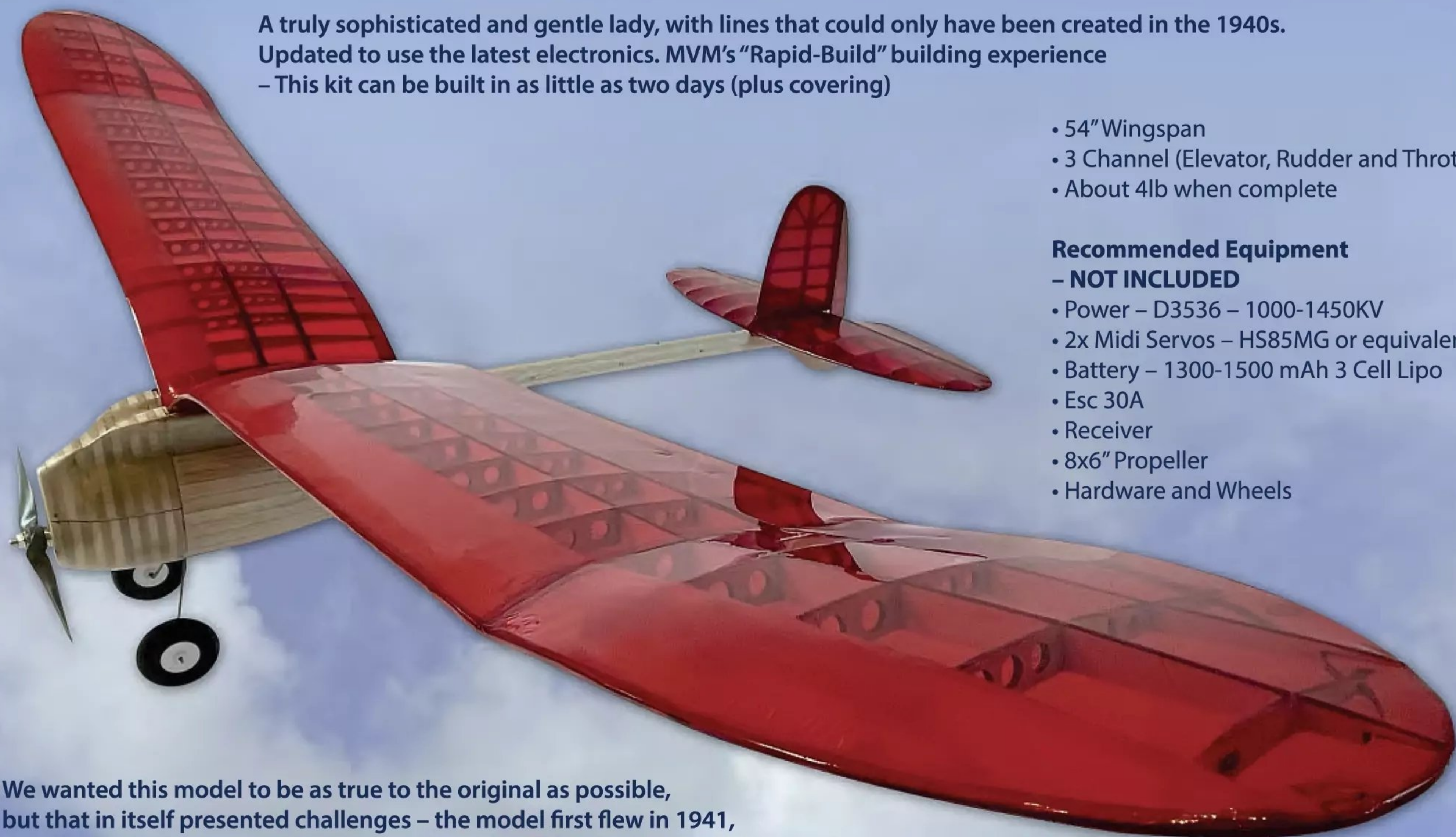


FJ-3 Fury in all its glory, posing at the field and awaiting its test flight.



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but that in itself presented challenges – the model first flew in 1941,
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- Battery – 2200 mAh 3 Cell Lipo
- 2 or 3 Servos – HS85MG or HS5058MG
- ESC 30 – 40Amp
- Receiver
- 9x6" propeller

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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@dhpub.co.uk**

If you intend to visit any events listed, then please check with the organisers before travelling in case of any last-minute changes.

JULY

Jul 14

Classic Gliders at The Hole of Horcum, North Yorkshire, YO18 7NR. A relaxed fun day for all types of traditionally built R/C model gliders. BMFA membership required. £5 for non-club members. Location: What3Words - snowmen.ordinary.caps. Walk to slope by 10am. Call Michael Kitchen on 01347 810685 for details.

July 14

Cocklebarrow Vintage R/C, signposted from Aldsworth, Glos. on the B4425 between Cirencester/Burford and off the A40 between Northleach and Burford (follow SAM35 signs). What 3 words: positives arrival calculate. All types of R/C up to 1975, sport flying, no competitions. BMFA insurance essential. For more information, please contact Tony Tomlin on 07767 394578 or 02086 413505 or email pjt2.alt2@btinternet.com

July 20

Longham Lake Fly-in, Christchurch & District MFC are hosting a waterplane fly-in at Longham Lakes. All fliers welcome but prop driven electric fixed wing only - no IC or turbines. EDF by agreement. Details of the lake, directions and local rules are at <http://cdmfc.org/html/longham.html>. Flying from 9:00 am - 16:00 pm but weather dependant. Contact Mike on roachfoxwood@aol.com the day before for final confirmation.

July 20 - 21

Pontefract Annual Fly-In at Pontefract Park, southwest corner of junction 32 of the M62, WF8 4QD. Saturday has all-electric, any R/C model type, fun fly (the exception being IC / Electric control line which can be flown on both days). Sunday has Single Channel and Retro Fly-In for all age appropriate IC and electric powered vintage and retro models (ideally up to the late 1970s but we are flexible as long as they fit in with the general theme of the day). To fly you must have insurance and CAA documentation plus any model over 7.5 kg requires BMFA B, LMA proficiency or equivalent certification. Feel free to display your models if you don't want to fly. Free entry, further details and updates at www.singlechannel.co.uk. Further details on finding the site, see map on pandas.bmfa.org. Limited free camping available, contact Phil Green on philg@talk21.com or Shaun Garrity on aeromodeller@gmail.com

Jul 27 - 28

Old Warden Modelling Weekend at Old Warden, Biggleswade, Beds. This year we're inviting other forms of modelling to join us to reflect R/C flying of all types, helicopters, free flight and radio assist, control line, R/C cars, boats, tanks, drone racing, rockets and trains. Trade line, swapmeet/car boot area, bring and buy, R/C trial experience flights, tethered cars, children's build and fly competition, R/C simulator. Weekend camping, available, excellent cafe not forgetting the Shuttleworth Collection and Swiss Garden. For more information visit shuttleworth.org and search 'ModelAir'.

Jul 27 - 28

Large Model Association Sleaf Large Model Airshow at Sleaf Airfield, Shrewsbury, Shropshire, SY4 3HE. See www.largemodelassociation.com for full details.

AUGUST

Aug 3 - 4

Wessex Soaring Association Slope Fly-in, held on first Saturday or Sunday of the month. Slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers welcome. BMFA insurance required. Contact Pete for more info at pete.carpenter12@gmail.com or call 07919 903742.

Aug 3-4

PSSA Fly for Fun event at The White Horse, Westbury, Wiltshire. Meet at the White Horse car park. Pilots brief at slope location at 10.30am each day. Proof of BMFA (or equivalent) insurance and Pilot Competency certificate required. All models to be fitted with compliant CAA OpID number. Note this meeting will only run with locally forecast winds from West through to North. For more information contact Phil Cooke on 07772 224719, email webmaster@pssaonline.co.uk or go to www.pssaonline.co.uk/about-us/events/

Aug 3

Bickley MFC Boot Sale at Bickley MFC, Church Road, Sutton at Hone, Dartford, Kent DA4 9EX. From 9:00am to 17:00pm. Boot sale for all your modelling bits and pieces. Also, a perfect place to grab a bargain! Non club members £5 to sell. Toilets on site. Camping must be pre-booked at admin@bickleymfc.org. For more information, visit <https://bickleymfc.org/> or contact James Gordon on 07966 439835.

Aug 4

Bickley MFC Scale Open Day at Bickley MFC, Church Road, Sutton at Hone, Dartford, Kent DA4 9EX. From 10:30am to 17:00pm. Scale models of all types welcome except turbines. Informal, relaxed scale fly-in. Toilets on site and camping available if booked in advance at admin@bickleymfc.org. For more information, visit <https://bickleymfc.org/> or contact James Gordon on 07966 439835.

Aug 10 - 11

Elvington Large Model Airshow at Elvington Airfield, Elvington, York, YO41 4AU. See www.largemodelassociation.com for full details.

Aug 11

Skelmersdale MFC Scale Day at 68 White Moss Rd South, Skelmersdale WN8 9TH. Weather permitting we hope to commence around 10 am. This is a low-key event designed around a day of fun. There are prizes for the winners in the categories on the day. You must have your own insurance and be competent to fly to A certificate standard. For more information please contact the organisers on 07811 224286.

Aug 17

Melton & District Open Flying Day & Swap Meet at Long Field Academy, Ambleside Way, Melton Mowbray, LE13 0BN. From 10:00 am to 16:00 pm. Free entry to flying display. Competition is £2 per competitor. Swap meet tables £5 each (4' x 2'). Entry to Swap Meet £3 per person. Visiting pilots are welcome to the open flying event if they hold at least a BMFA 'A' Certificate and insurance and show proof on the day. For further details or for booking a table, please contact meltonmodelclub@virginmedia.com

Aug 17 - 18

British Fun Fly Association Nationals at BMFA Buckminster, Lincs. While this is a formal National Championship, first timers and novices are still very much welcomed and encouraged. To find out more about Fun Fly, the rules and the different classes, take a look at <https://funfly.bmfa.org/> and keep an eye out on the BFFA Fun Fly Facebook group for the latest news.

Aug 17 - 18

PSSA Fly-In at The Bwlch, Nant-y-Moel, Bridgend, South Wales. Kindly supported by the SWSA - <http://a470soaring.blogspot.co.uk/>. Meet at the 'Ice-Cream' car park for 10am each day. 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/

Aug 17 - 18

Greenacres August Fun Fly at WS9 0QQ, off Bosty Lane, in Aldridge near Walsall and follow signs onto the park. Campers and caravans can arrive after 1:00 pm on the Friday before. Water, Portaloos, raffle and catering are all available for a small donation. Visiting pilots fly for £10 on Saturday and £5 on Sunday, but spectators and the public are free! If you have any special requests or requirements please contact Jim Mchugh at jim.mchugh@greenacresmac.co.uk. For more information please visit the club website: <http://www.greenacresmac.co.uk> or Facebook: <https://www.facebook.com/GreenacresMAC>

Aug 18

Cocklebarrow Vintage R/C, signposted from Aldsworth, Glos. on the B4425 between Cirencester/Burford and off the A40 between Northleach and Burford (follow SAM35 signs). What 3 words: positives arrival calculate. All types of R/C up to 1975, sport flying, no competitions. BMFA insurance essential. For more information, please contact Tony Tomlin on 07767 394578 or 02086 413505 or email pjt2.alt2@btinternet.com

Aug 24 - 26

August Bank Holiday Fly-in Rolls Royce Hucknall MAC at Underwood, NG16 5GA. What three words - laws.wasp.upgrading. 5 mins Junction 27 M1. Come fly your scale models. All BMFA members welcome, with a competition for best scale model. Camping available but must be pre-booked. For



more information contact Terry at 07971 707585 or email terry.33cway@hotmail.com.

Aug 31 - Sep 1

Southern Model Show at Headcorn Aerodrome, Headcorn, Kent, TN27 9HX. Full flying display both days with Saturday evening fireworks, model boat pond, car racing, bring-and-buy stall, full trade and catering village. Details at www.facebook.com/p/Southern-Model-Show and on-line ticket sales to follow soon.

SEPTEMBER

Sept 7 - 8

Popham Model Show at Popham Airfield, just off the A303, Coxford Down, SO21 3BD. Full flying display on both days, 10am - 4pm. Jets, large models and top class pilots. Supported by traders and a catering village. Model boating lake, Off road R/C car racing, FPV drone racing. Book online at popham-airfield.co.uk

Sept 7 - 8

Wessex Soaring Association Slope Fly-in, held on first Saturday or Sunday of the month. Slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers welcome. BMFA insurance required. Contact Pete for more info at pete.carpenter12@gmail.com or call 07919 903742.

Sept 7 - 8

Much Marcle Large Model Airshow 2024 at the Much Marcle Steam Show, Ledbury, Herefordshire, HR8 2LX. See www.largemodelassociation.com for full details.

Sept 8

Scale Gliders at The Hole of Horcum, North Yorkshire, YO18 7NR. A relaxed fun day for all types of traditionally built R/C scale gliders. BMFA membership required. £5 for non-club members. Location: What3Words - [snowmen.ordinary.caps](https://www.what3words.com/snowmen.ordinary.caps). Walk to slope by 10am. Call Michael Kitchen on 01347 810685 for details.

Sept 8

Vintage Fly-in hosted by SAM 35 at RNAS Merryfield, Ilton, Somerset, TA19 9HN. Super 60/ Junior pylon race, Class A, B & C VPD, control line circuit and flying off the peg. Free registration on the day. Contact Louis Hawkins on 07768 862630 or email louis@louishawkins.plus.com.

Sept 14

Tonbridge Cassers and Rubber Fanciers Indoor Flying at Kings Sport Centre, 601 Maidstone Road, Rochester, ME1 3QJ. From 6:30pm until 10:00pm. Freeflight, Lightweight RC and 3D RC timed flying sessions throughout the evening. For more information contact Steve on 0208 942 5000 or Eric on 07763 398 416.

Sept 14

Longham Lake Fly-in, Christchurch & District MFC are hosting a waterplane fly-in at Longham Lakes. All fliers welcome but prop driven electric fixed wing only - no IC or turbines. EDF by agreement. Details of the lake, directions and local rules are at <http://cdmfc.org/html/longham.html>. Flying

from 9:00 am - 16:00 pm but weather dependant. Contact Mike on roachfoxwood@aol.com the day before for final confirmation.

Sep 15

Basingstoke Model Aero Club Electric Fly-In 24 at Harrow Way & Manor Farm Lane, Basingstoke, Hants. Gates open 9:00 am with a pilots' briefing at 9:45 am and then the fun starts at 10:00 am. Free entry and car parking, but we hope to get you to buy some raffle tickets. BBQ and drinks also available. BMFA proof of insurance required. Location and contact details at bmac.bmfa.club/events or @basingstokemac on Facebook.

Sep 21 - 22

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. For more information contact Phil Cooke on 07772 224719, email webmaster@pssaonline.co.uk or go to www.pssaonline.co.uk/about-us/events/

Sep 22

Cocklebarrow Vintage R/C, signposted from Aldsworth, Glos. on the B4425 between Cirencester/Burford and off the A40 between Northleach and Burford (follow SAM35 signs). What 3 words: positives arrival calculate. All types of R/C up to 1975, sport flying, no competitions. BMFA insurance essential. For more information, please contact Tony Tomlin on 07767 394578 or 02086 413505 or email pjt2.alt2@btinternet.com

Sept 27, 28, 29

Bring & Fly at Pen Y Berth, Pwllheli, Gwynedd, LL53 7HG. Hosted by the Lleyn Model Aero Club. As well as our superb grass strip where our club house is, we have fantastic slope soaring sites nearby. We will be serving refreshments, bacon butties etc. at our club site over the weekend. There will be a sales tent for selling model goods. Camping/ caravanning facilities are adjacent to our site with a cafe/bar. Public spectators are welcome, trial flights can be arranged as well as training for A tests etc. For further details please contact Frank Pilling on 07867 361905 or visit lleynmac.org.uk

OCTOBER

Oct 5 - 6

Wessex Soaring Association Slope Fly-in, held on first Saturday or Sunday of the month. Slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers welcome. BMFA insurance required. Contact Pete for more info at pete.carpenter12@gmail.com or call 07919 903742.

Oct 12

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

Oct 19 - 20

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. For more information contact Phil Cooke on 07772 224719 email webmaster@pssaonline.co.uk or go to www.pssaonline.co.uk/about-us/events/

Oct 22

PMAC Swapmeet at Chelford Village Hall, Knutsford Rd, Chelford, Macclesfield, SK11 9AS. From 7:00 pm to 9:00 pm, doors open for table holders at 6:30 pm. Tables £10 each (includes entry for one person). Entry £3 per person. Tables limited to 30 only, table booking required. Vehicles greater than 2.1 m tall will need to be advised to the organiser (below) due to parking restrictions. Table bookings required by contacting Tim Cheal on tim.cheal@btinternet.com

Oct 27

Leafields MAC Autumn Swapmeet at Pinxton Miners Welfare, Wharf Road, Pinxton, Derbyshire, NG16 6NY. Doors will be open to the public at 10:00 am and traders are welcome from 08:45 am onwards. Admission is £2 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.

NOVEMBER

Nov 2 - 3

Wessex Soaring Association Slope Fly-in, held on first Saturday or Sunday of the month. Slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers welcome. BMFA insurance required. Contact Pete for more info at pete.carpenter12@gmail.com or call 07919 903742.

Nov 24

Southern Counties Autumn Swapmeet, Mountbatten School, Romsey, Hampshire, SO51 5SY. One of the largest swapmeets in Southern England with over 50 tables. Please note revised times: sellers with a booking admitted from 8:00am. Buyers from 8:30am onwards. Noon finish. Admission only £4, under 16s free. First table costs £9 (including one admission), additional tables cost £5 each. Refreshments will be available. To pre-book tables only call Mike Stokes on 07702 742647 or for more details visit hmfa.bmfa.org/

DECEMBER

Dec 7 - 8

Wessex Soaring Association Slope Fly-in, held on first Saturday or Sunday of the month. Slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers welcome. BMFA insurance required. Contact Pete for more info at pete.carpenter12@gmail.com or call 07919 903742.

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X360 HELICOPTER with transmitter, 5 batteries, 2 spare booms, spare tail blades, spare main blades and more spares - £400 plus £45 P&P approx. or buyer to collect. 07787 574932 (York).

SPEKTRUM DX8G2 transmitter, little use, like new. Boxed with charger and manual - £135 plus postage. E-flite Viper 70, ducted fan jet with flaps and retracts. Spectrum AR636A Safe Rx with little use - £150. Buyer to collect. 07300 835793 (Suffolk).

HANGAR 9 FOKKER DVII untouched, complete ARTEF, 63" span, electric or IC - £150 plus P&P. Hangar 9 Jackal 50 with West 52 VI and Mini Pipe, includes servos, in immaculate condition - £150. Buyer to collect. 07300 835793 (Suffolk).

PITTS SPECIAL, 52" span from the Radio Modeller plan. Covered in white Solarfilm, includes Futaba servos and Turnigy motor. Requires your ESC, LiPo and receiver - £75. Buyer to collect. 07866 661269 (Wales).

SEAGULL PC6 PORTER with servos and Irvine .53 engine. No crashes and only a few flights - £200. Hangar 9 Pulse XT40, only two flights, with servos and SC .46 engine - £160. Call Mike on 07875 501354 (Lancs).

CARL GOLDBERG BUCKER JUNGSMANN kit, 68" span, .40 - .60 engines or equivalent four-stroke - £375. 07800 871829 (Haverfordwest).

ARROWS EDGE 540 foam aerobat. Comes with LiPo battery with only three flights. Originally cost £300 plus, will accept £100. Call Reg on 01242 672479 (Glos).

WOT 4 XL with OS95 AX. Acro WOT with OS55 AX. Both models in decent condition - £90 each. Call Reg on 01242 672479 (Glos).

AEROMODELLER ANNUALS 1948-1989 inclusive. SAM 35 yearbooks x 11. Miscellaneous Sam 35 speaks - £70 ono. Raising funds for Museum of Berkshire Aviation. 01494 445636 (Bucks).

FUTABA 6J 6-channel transmitter with charger - £45. Slope soarer available with electrics free of charge, Orion and charger with Futaba. 01903 237494 (East Sussex).

FW190 Tony Nijhuis design, 60" span, very detailed, new electrics from 4-Max. Electric retracts. Never flown, just taxied down the drive - £250 ono. Call Keith on 07546 418978 (York).

CLEAR OUT due to ill health. R/C models, wings, fuselages, tools, spare parts, some foam wings, not used. Many RCM&E and Radio Modeller magazines too. Call Nick on 01252 676461 (Hants).

APACHE AVIATION FAIRCHILD PT19, 75" span, 80 ASP and flaps, in mint condition and unflown. US Army colours, pro-built - £230. Buyer to collect. 07921 919383 (Essex).

SAITO 82B Brand new in box, never been run or fitted to a model - £240 + £10 postage. 01709 540976 (Rotherham, S. Yorks).

NEW MINI BIPE, requires fitting out. New Easy Pigeon electric. Used Easy Pigeon electric. New Filip electric brushless motor. Futaba transmitter, 6 EX AP charger with only 2 battery charges. Job lot - £100. 01623 400534 (Mansfield).

B17 FLYING FORTRESS, wingspan 2m (79 ins), 4 brushless motors. 2 x 14.8-volt batteries. Undercarriage, retracts and

wing lights. Needs 8 channel Tx and Rx. Collection only - £350. 07806 816434 (Birmingham).

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SPECTRUM DX6i Tx & Rx - £60. Spectrum AR400 RX - £15. Laser Hitec R/C system - £30. GT15 OS Petrol N.I.B - £50. Vintage spark ignition, Super 60 - £90. All plus P&P. Call Peter on 07739 545444 (Cheshire).

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KAVANJET RANGER wooden main rotor blades wanted. Even a damaged set for repair would be welcome. Appreciate any help with this request. Blades are 735 mm length and a cord of 55 mm. Call Peter on 01722 341212 (Wilts).

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BOULTON PAUL P-75 OVERSTRAND

Having a preference for ugly planes, Jon Harper considered several rarely modelled types. Then he came across the Boulton Paul P-75 Overstrand and decided that that it was sufficiently ugly for his eyes!

The Overstrand was the last RAF twin-engine medium bomber biplane. It saw service in the late 1930s and by the outbreak of WW2 only a few training unit aircraft remained in operation. It was the first RAF plane fitted with an enclosed pneumatically powered nose turret, enclosed cockpit and shielded dorsal and ventral gun positions.

If, like Jon, you are attracted to ugly aeroplanes then why not clear your workbench and make a start on your own Overstrand using the free pull-out Pro-Plans in the next issue. It's a two-parter so be sure to bag a copy of the November issue too!

HANDLEY PAGE HALIFAX

When long-time clubmates at Northampton MAC, John Rogers and Bill Pilsbury, set out to build a big four-engine WW2 bomber they decided that the Lancaster was a little over-modelled and the Halifax fitted the bill perfectly. The example modelled hails from 466 Squadron RAAF, based at RAF Driffield in

Yorkshire. The squadron was manned by airmen from the British Commonwealth and it is likely that HD-Q Queenie had a Canadian crew.

Join Jeff Barringer as he describes the 22 months' worth of research, design and building by John and Bill which yielded this eye-catching 104-inch scale model.



FLAIR FLY-IN

When Mike Freeman visited the Flair Fly-In at Banbury MFC in July he imagined a real nostalgia event on a nice summer's day with lots of the trademark Flair semi scale WW1 biplanes and monoplanes wafting around in the summer sunshine.

Unfortunately, the weather had other ideas, with rain and strong winds forecast. But the organisers stuck to their guns and so Mike joined a group of hardy BMFC clubmates and fellow visitors in the clubhouse, huddled around a raging wood burner. Then, all of a sudden, the rain stopped and a flurry of activity ensued....

It turned out to be a thoroughly enjoyable day. The folks that turned up were a friendly bunch and made the most of the weather. Most of them got to fly too, leaving Mike struck by the love and dedication people have for building, fettling and flying Flair models.



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PARTING SHOT

HANDLEY PAGE HALIFAX

These photos were taken by Bill Pilsbury of a joint venture between him and John Rogers of the NMAC. Built to 1:12 scale the aircraft is of a 106 Squadron Halifax, designed by Bill and scratch-built by him and John Rogers. Research and design took about three months, but it had to be redesigned when several parts were found to be unavailable.

The fuselage is sheeted, built around a full-length box with formers top and bottom. The

tailplane has been increased slightly in area and the rudders are hinged as the full size. The wing has two full length, full depth spars and is joined to the fuselage with carbon tubes which reach out through the inner nacelle.

Not including the sheet and strip wood, there were 880 plus cut parts.

Jeff Barringer

Coming soon! Read the full story of the NMAC Halifax in a future issue of RCM&E.

DATAFILE

Photo by:	Bill Pilsbury
Camera:	Canon EOS 6D
Lens:	Sigma 150-600 mm f/5.6-6.3 DG OS HSM
Aperture:	f/16
Shutter speed:	1/2000 sec
ISO:	2000
Focal length:	313 mm
Metering:	Partial



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Angels & Hawks



XFLY Model is proud to announce its second scale fighter jet the F-18 Hornet in the twin 40mm EDF lineup. For the purpose of making it as streamlined and true-to-scale as possible, XFLY team equips the F-18 with twin power system setup with true-to-scale details including air inlets, accurate scale detailed cockpit, nozzle and full-flying horizontal stabs. The factory-installed power system, including twin efficient 1413-KV5500 brushless motors and twin 20A brushless ESCs, paired with a 4S LiPo battery, delivers an abundance of thrust for fast climbs, rolls, loops and endless fun for high alpha flying due to the F-18's low wing load and full flying stabs. Perfectly designed landing gear helps keep the plane lightweight and makes take offs & landings very smooth (the landing gear can easily be removed for more speed and vertical performance). The twin EDF power system, with smooth-flow inlet duct design, delivers an incredible turbine-like sound. Choose between the popular schemes, 'Blue Angels' or 'The Hawks', the XFLY F-18 is a must-have addition to your fleet.



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| • RECOMMENDED BATTERY: | 4S 1300 - 2600mAh |
| • EDF SIZE: | 40MM EDF 12-Blade x2 |
| • OVERALL LENGTH: | 980mm / 38.6in |
| • WING AREA/LOAD: | 11.5DM ² / 82G/DM ² |
| • FLYING WEIGHT: | 950G |
| • SKILL LEVEL: | INTERMEDIATE |
| • MOTOR SIZE: | 1413-KV5500 2 |
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| • SERVOS: | 9g servos x 5 |
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OF THE OUTER PANELS PARALLEL TO
THE UPPER SURFACES HAVE

J3

L.E. 5mm Balsa

FALSE L.E. 2.4mm Balsa

SUB-SPAR

MAIN SPAR

1.5mm Balsa SHEETING

R3

R2

R1

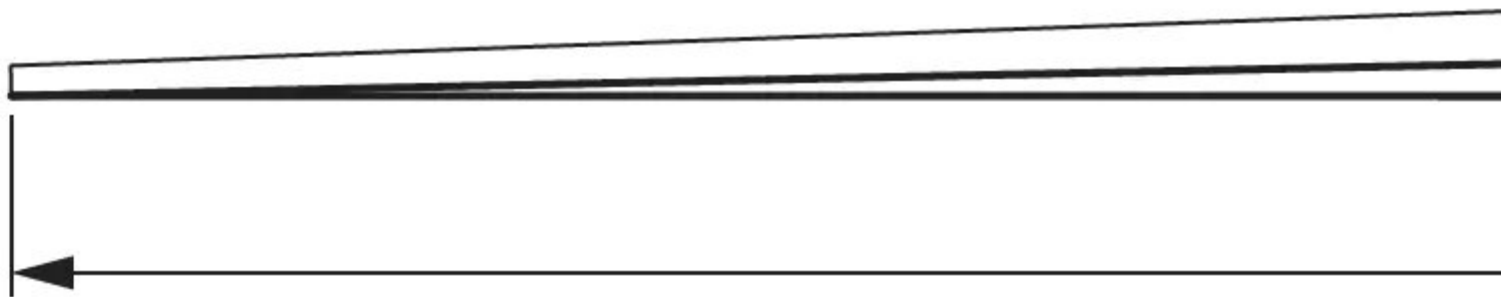
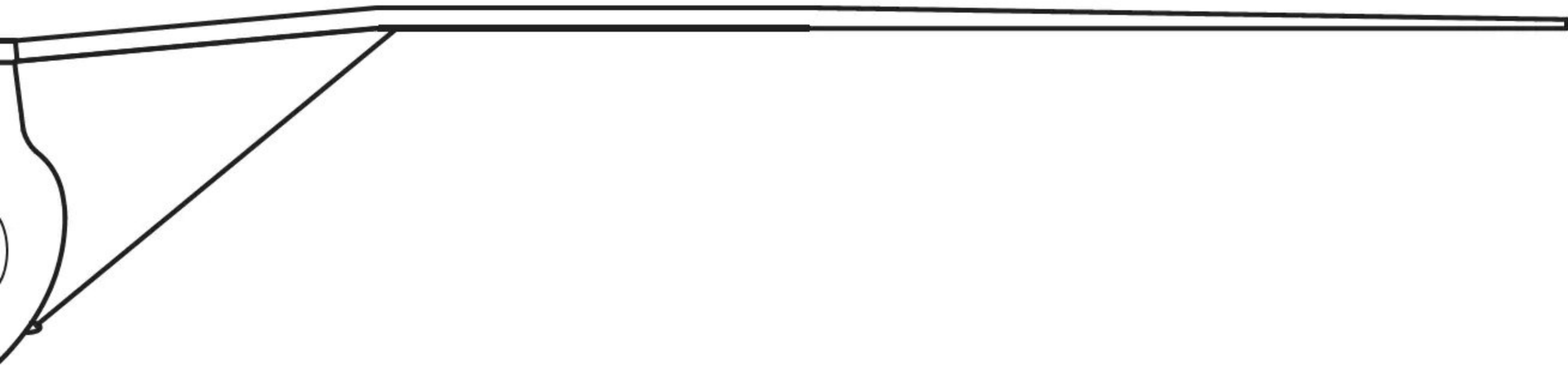
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1.5mm Balsa SHEETING

1.5mm Balsa
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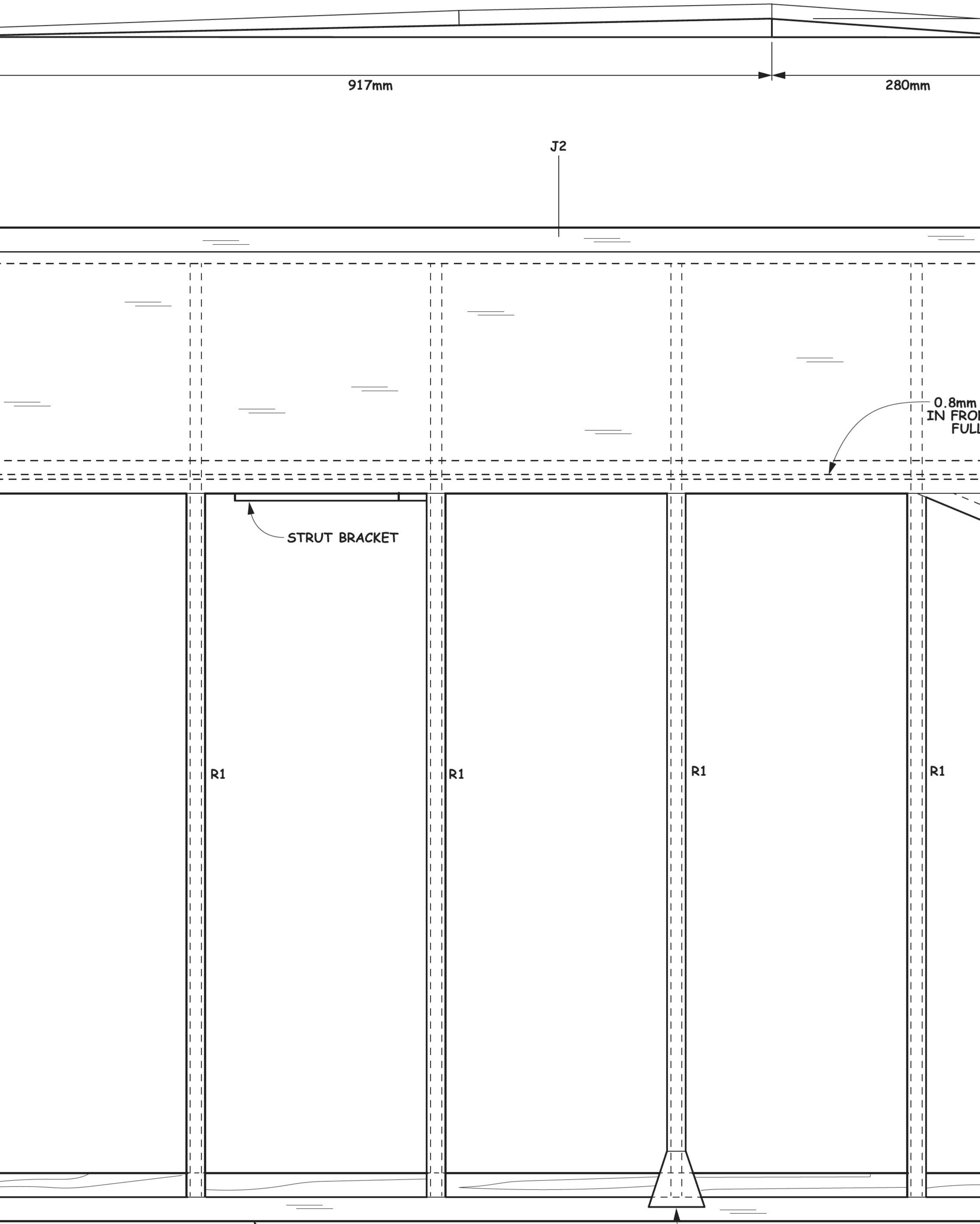
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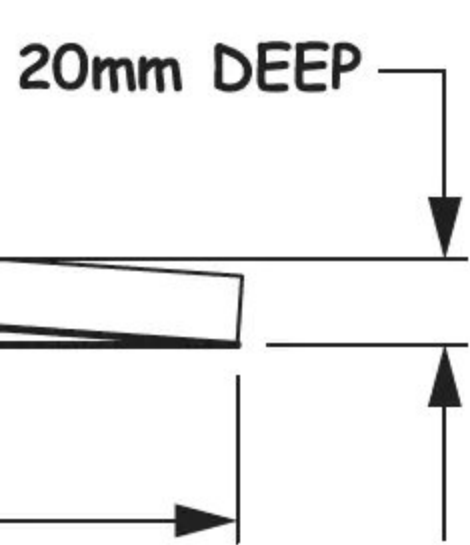
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GULL WING JIGS
MAKE UP FROM 6mm BALSA:
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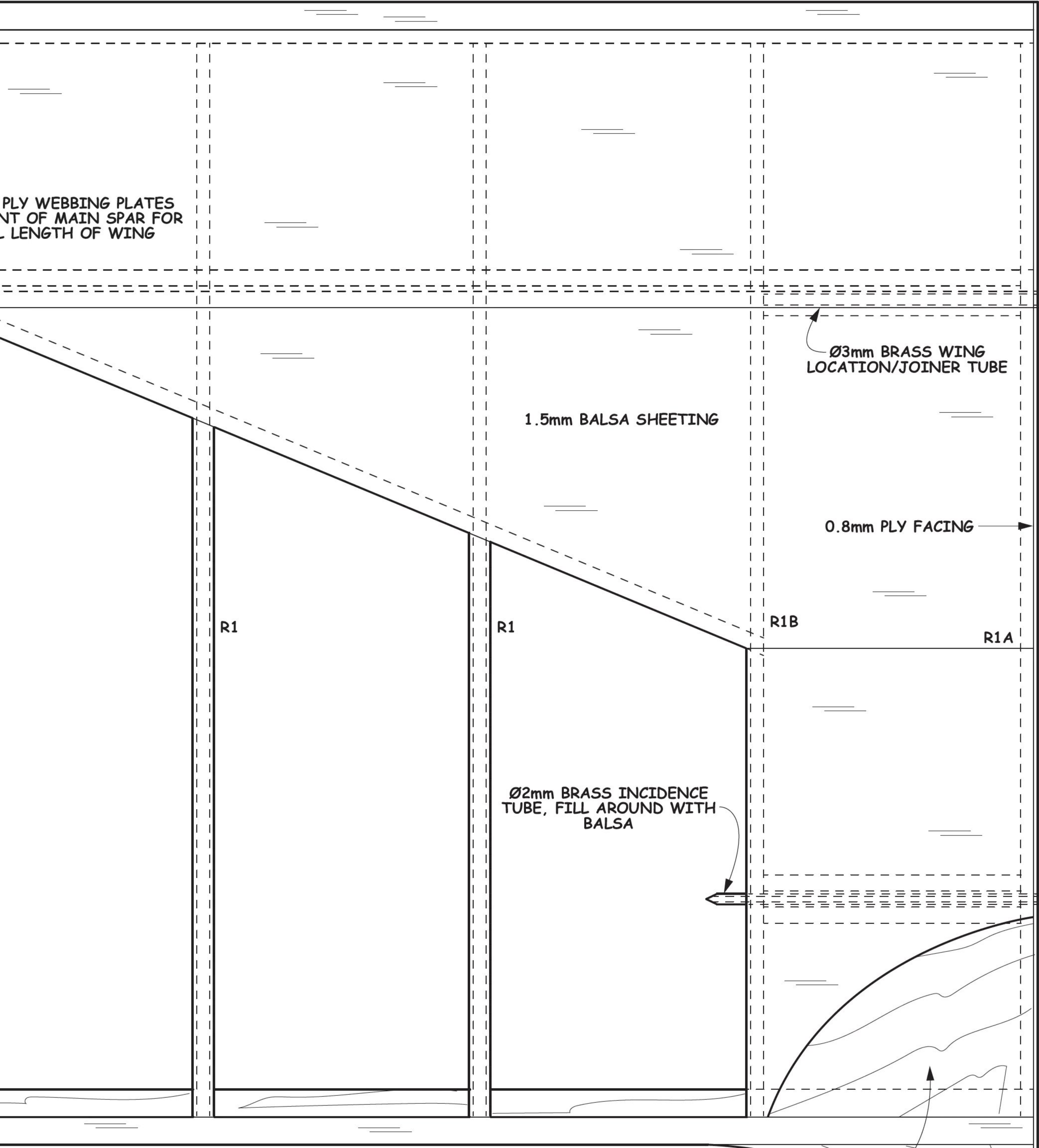




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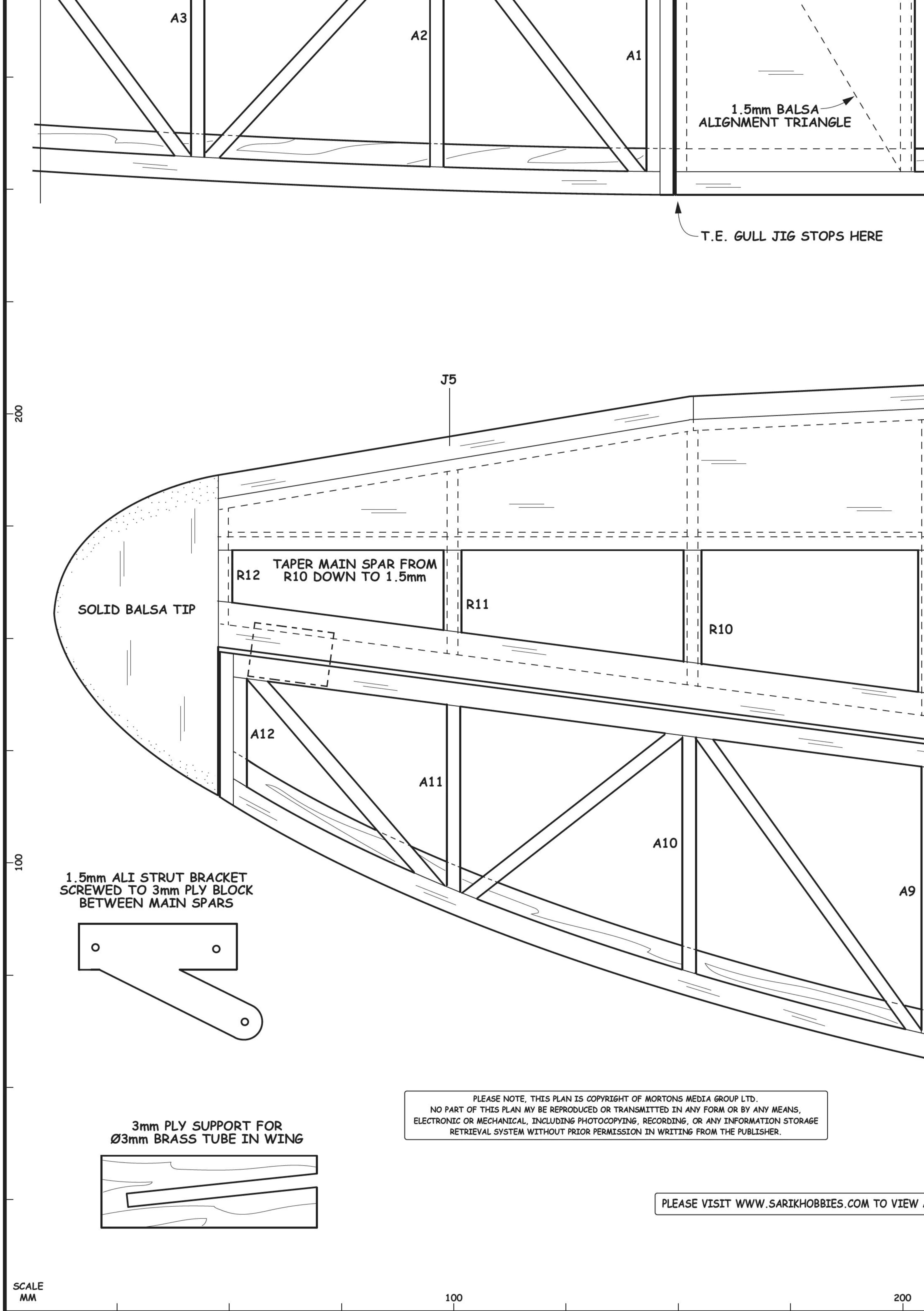
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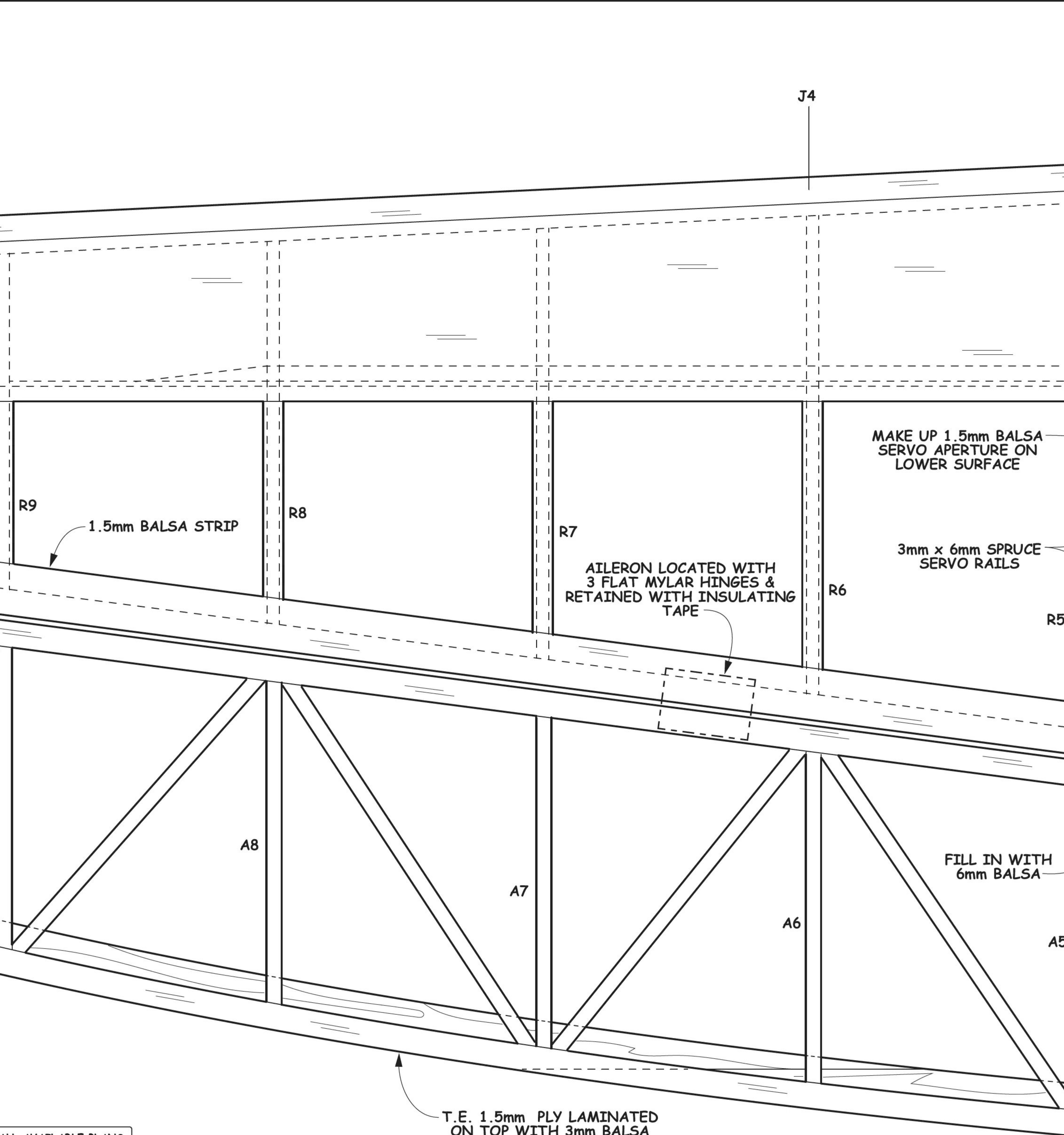
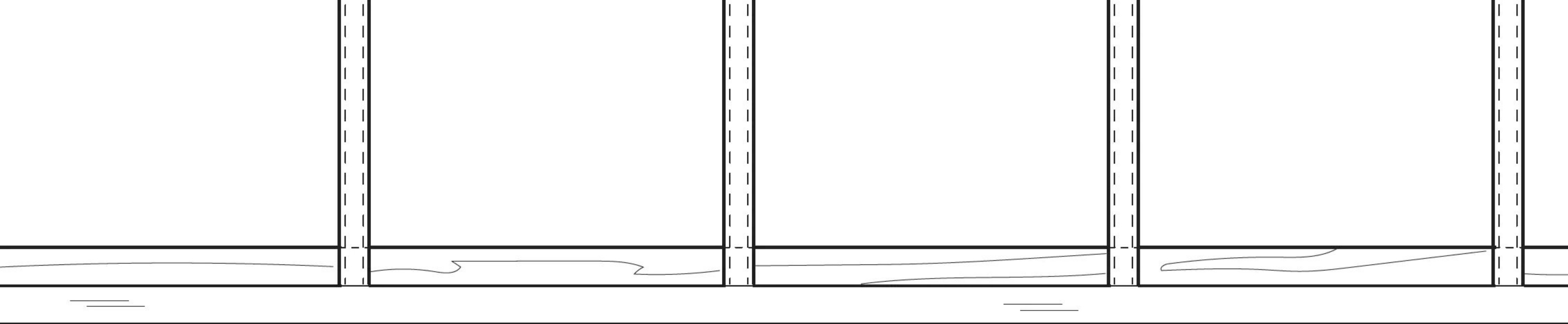


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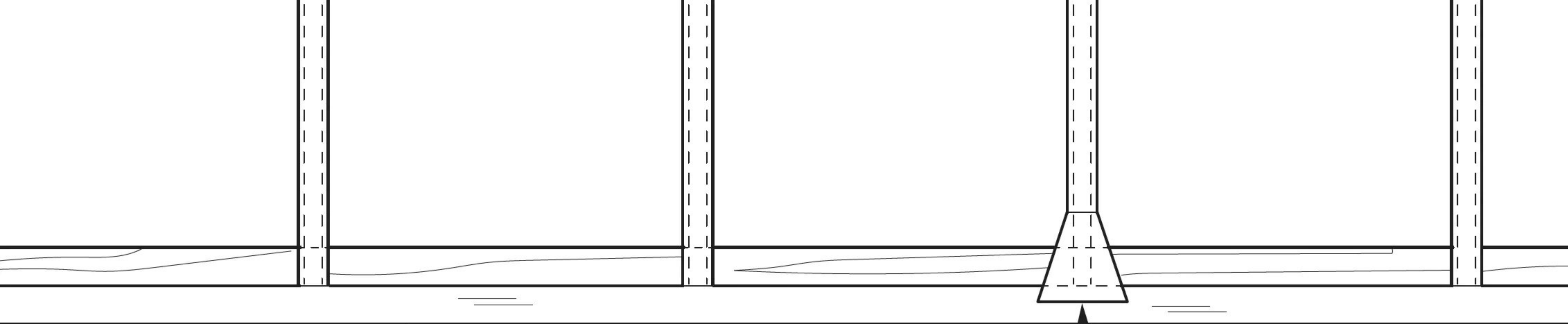
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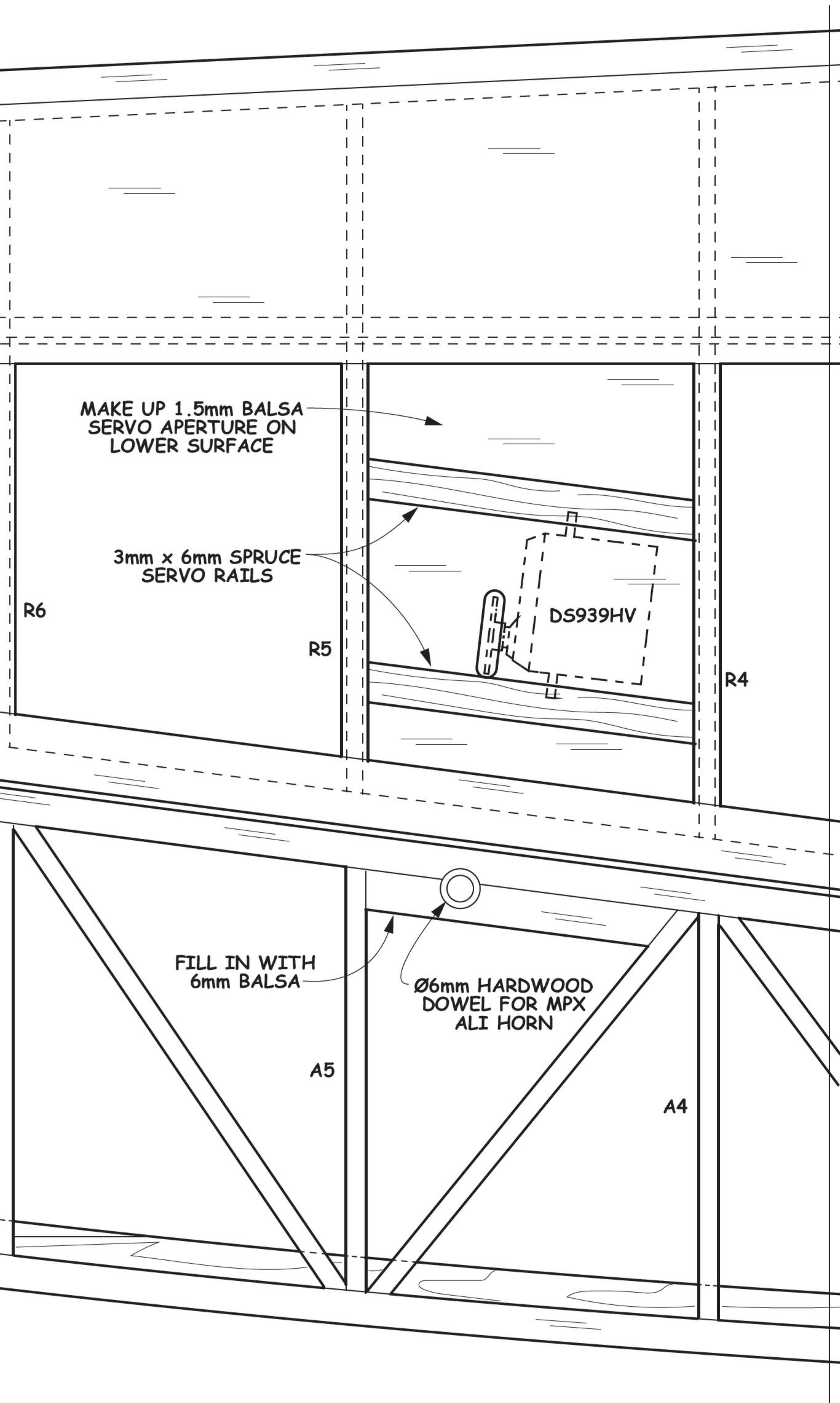


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DS939HV

R6

R5

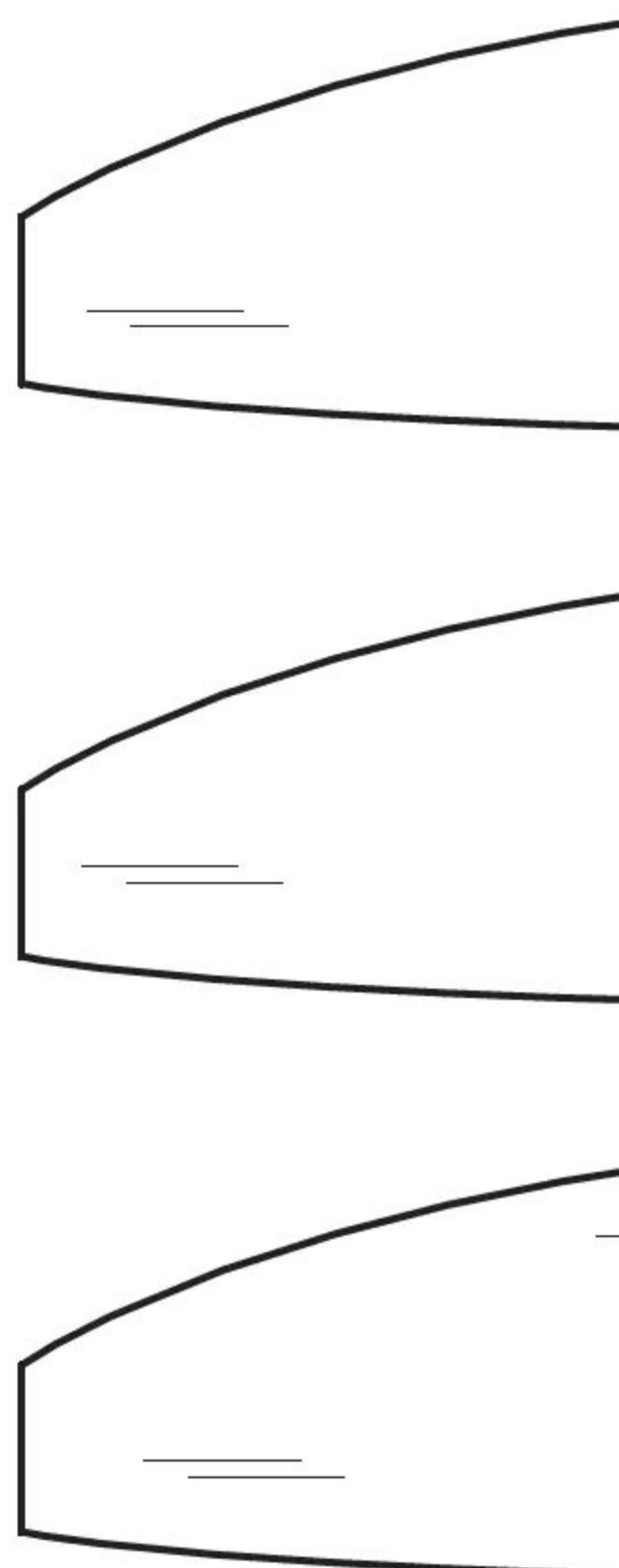
R4

A5

A4

FILL IN WITH
6mm Balsa

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DOWEL FOR MPX
ALI HORN



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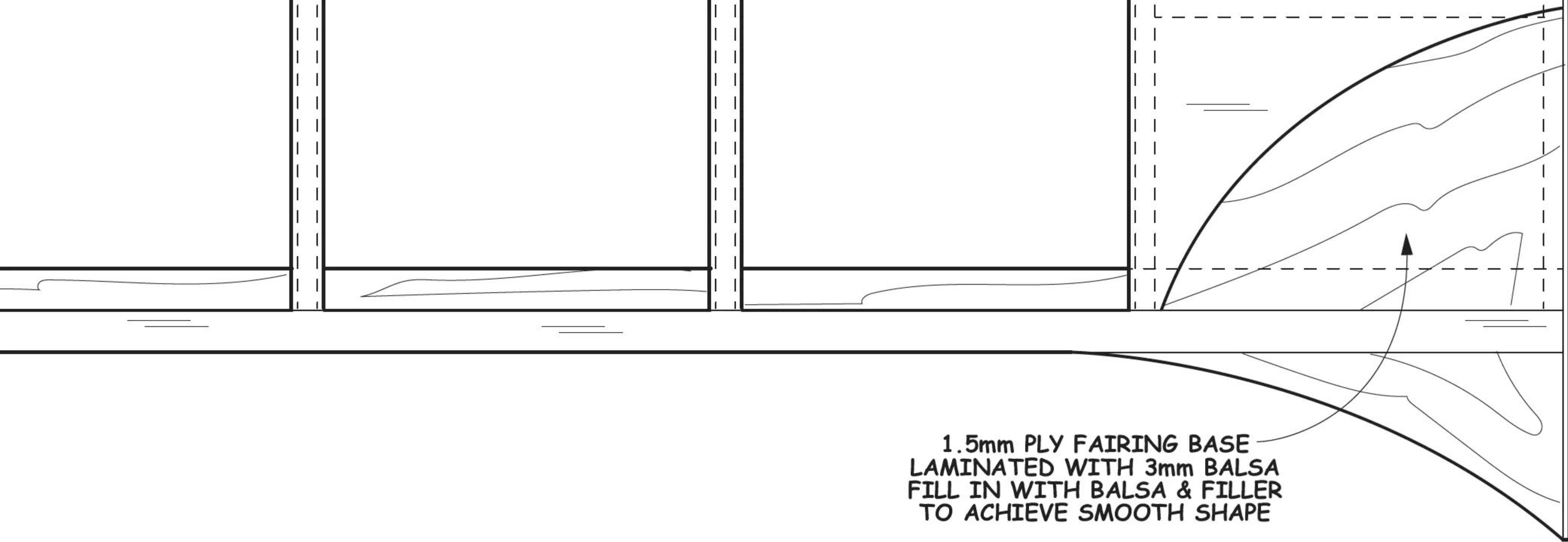
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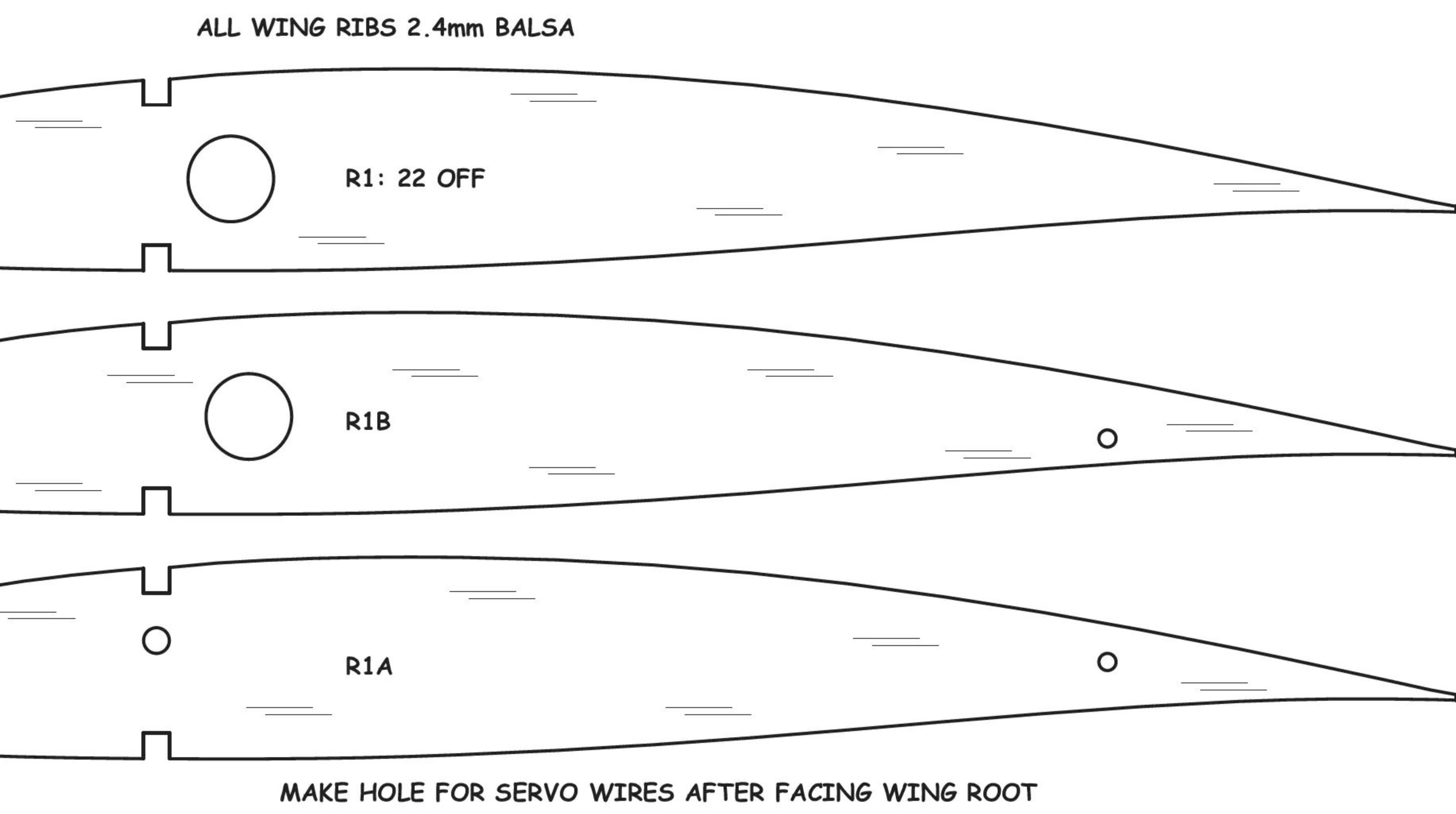
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WING

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12



16

WING CONSTRUCTION

THE CENTRE SECTION FIRST

THE CENTRE SECTION

GLUE LAMINATED T.E. TO BOARD, ADD OUTER RIBS, 3mm SQ. SPARS & BRASS TUBE
GLUE ABOVE & BELOW BRASS TUBE WITH 3mm Balsa & WEB BOTH SIDES OF SPARS WITH 0.8mm PLY
ADD CENTRE RIBS & FILL BETWEEN WITH BLOCK Balsa, ALLOWING APERTURE FOR SERVO LEADS
GLUE CENTRE SECTION UNDERSIDE WITH 1.5mm Balsa
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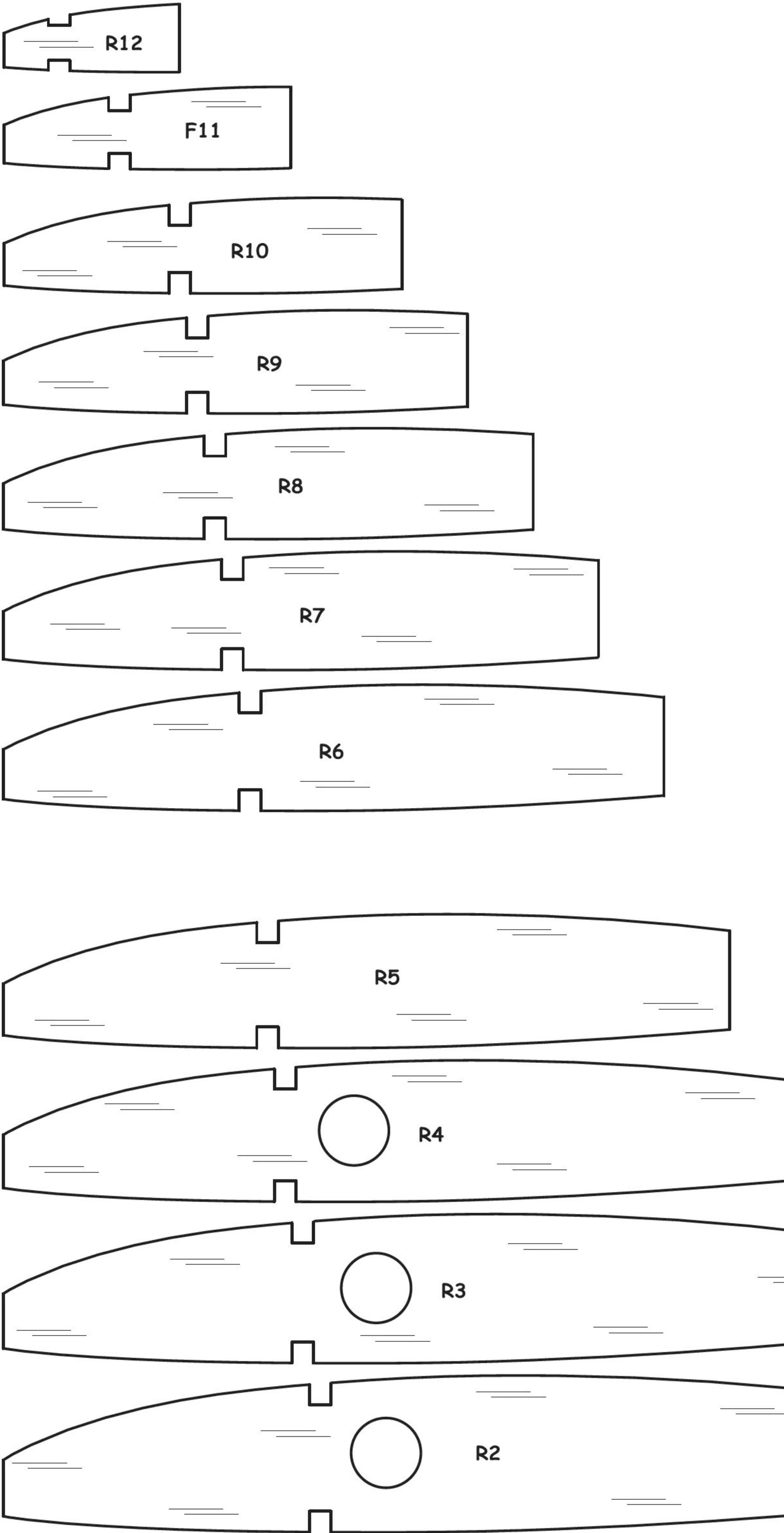
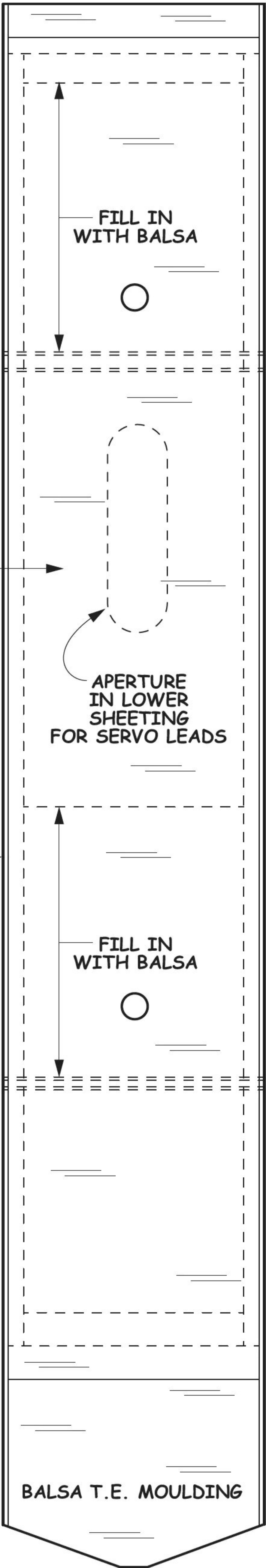
THE OUTER PANELS

GLUE LAMINATED T.E. TO JIG OVER PLAN (PRE-STEAM THE BEND AFTER LAMINATION)
GLUE LOWER SPAR OVER SUPPORT, TAPE TO SUPPORT IN PLACES BETWEEN RIB POSITIONS
GLUE RIBS, FALSE L.E, AILERON SPAR, FOLLOWED BY UPPER SPAR (OFFER UP R2 TO LOCATE AILERON SPAR ON R1)
GLUE 0.8mm PLY WEBBING PLATES TO FRONT OF SPAR ENTIRE LENGTH OF WING, THEN FIT 3mm BRASS TUBE AT ROOT
GLUE SLOTS & FIT UPPER & LOWER SUB-SPARS, SHEET UNDERSIDE OF WING WITH 1.5mm HARD Balsa
(JIGGING REQUIRED AT THIS STAGE), INCLUDE 1.5mm Balsa STRIPS OVER AILERON SPAR
REMOVE WING ON JIGGING SUPPOERTS, ADD TOP SHEETING, WEIGHING DOWN TO KEEP FLAT

20

600

700



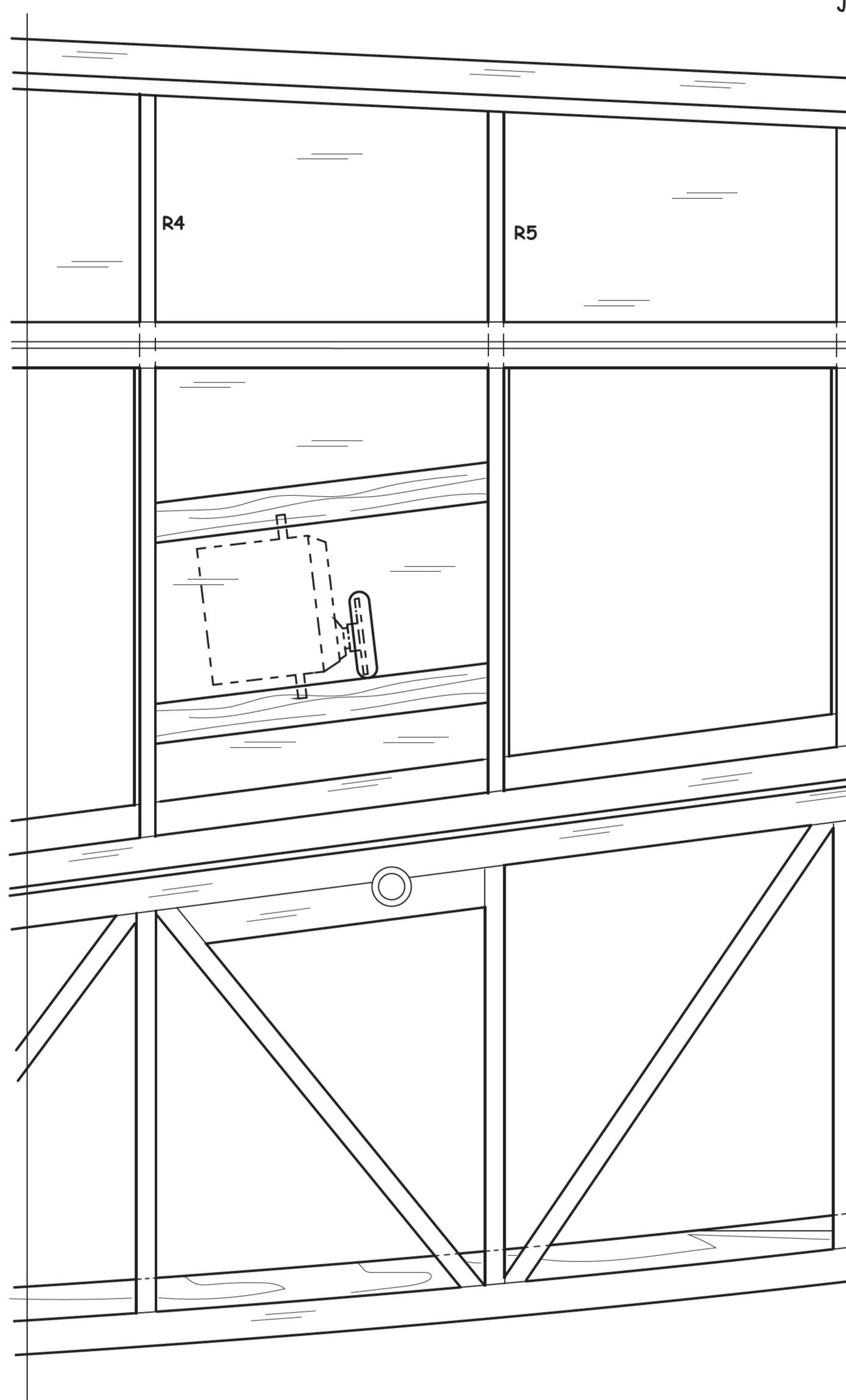
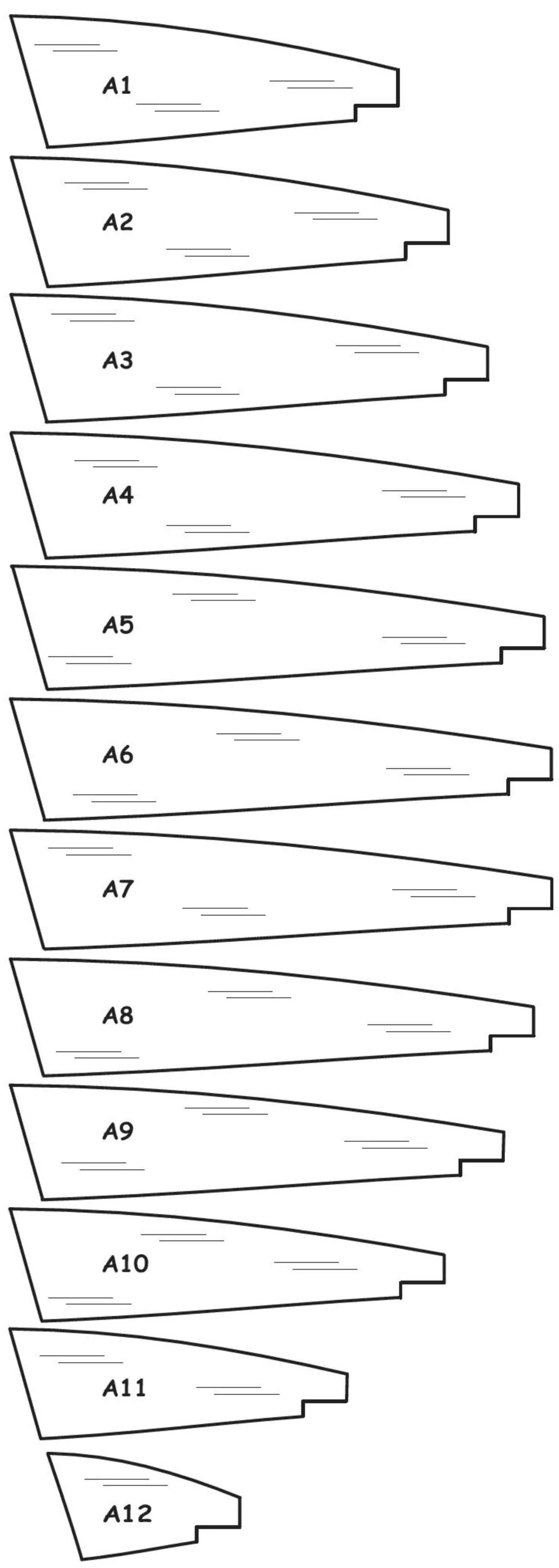
WINGS RETAINED WITH INSULATING TAPE ON TOP SURFACE ONLY

500

300

J1

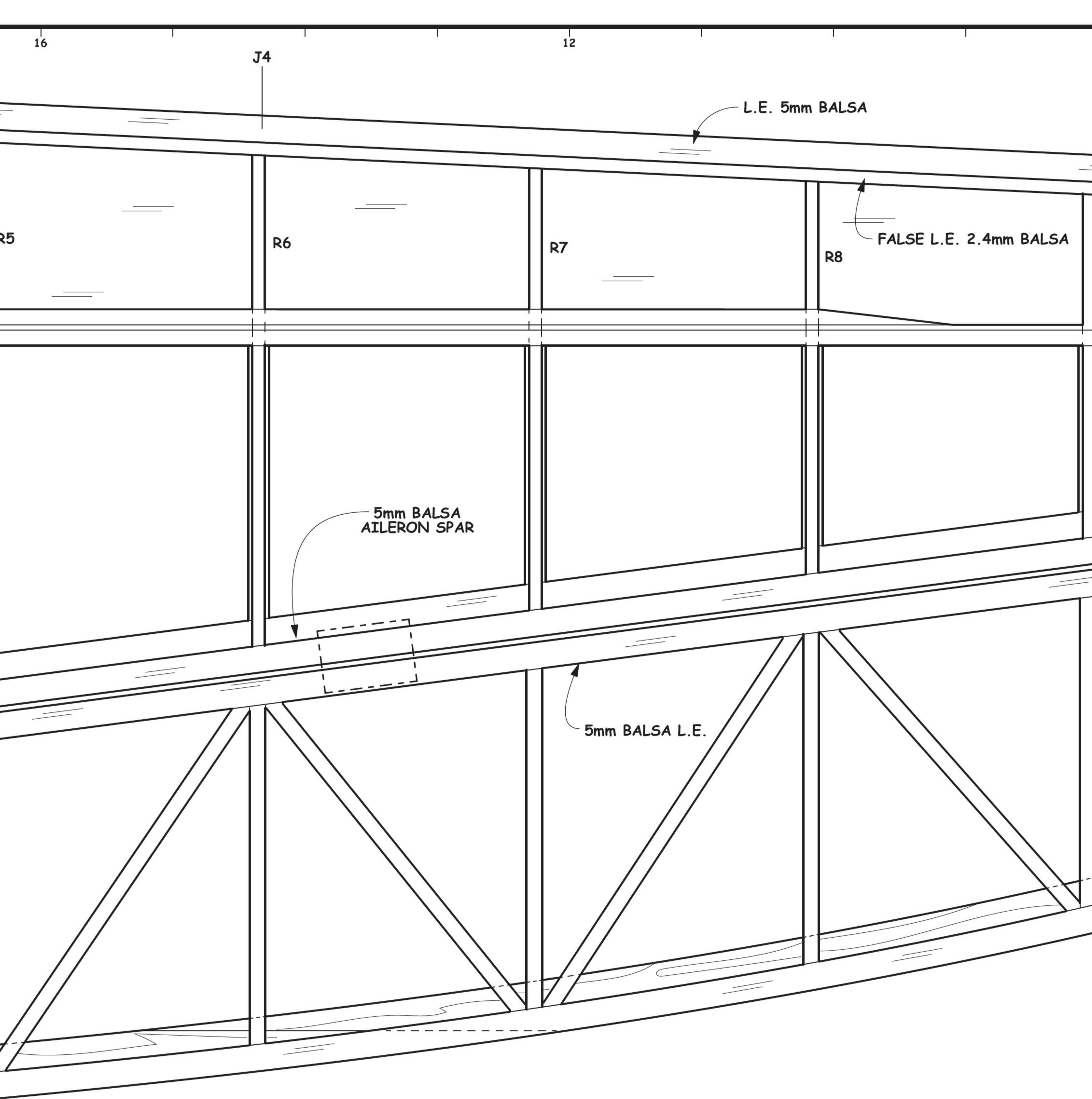
AILERON RIBS 3mm Balsa



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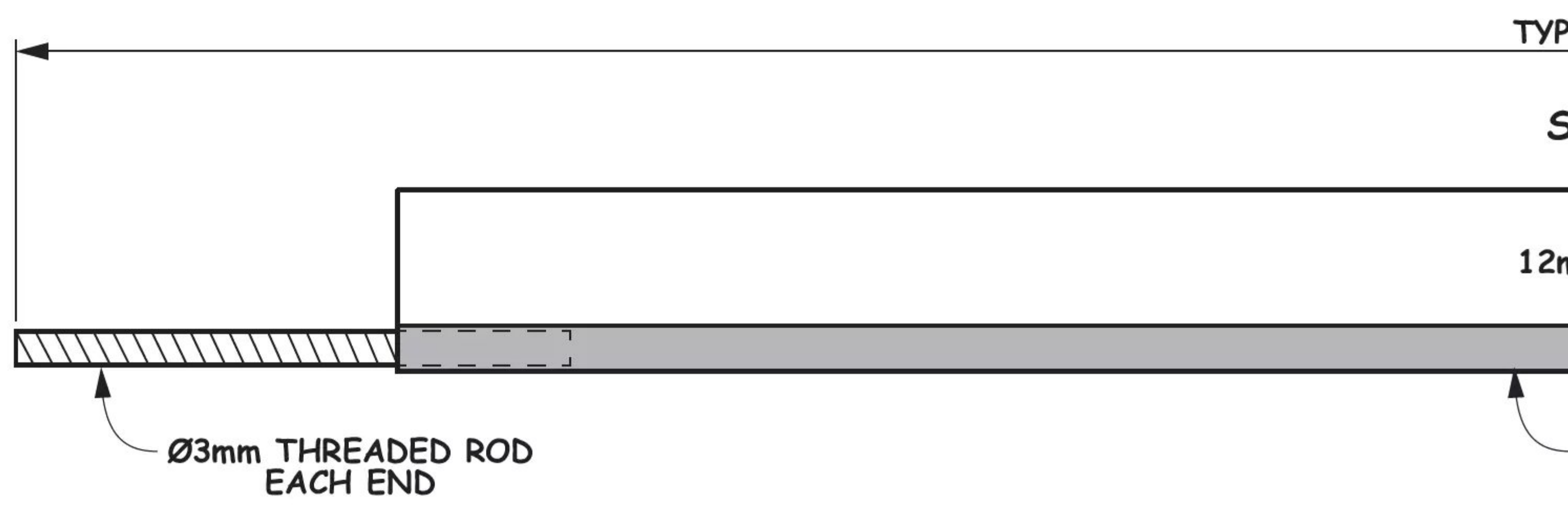
J2

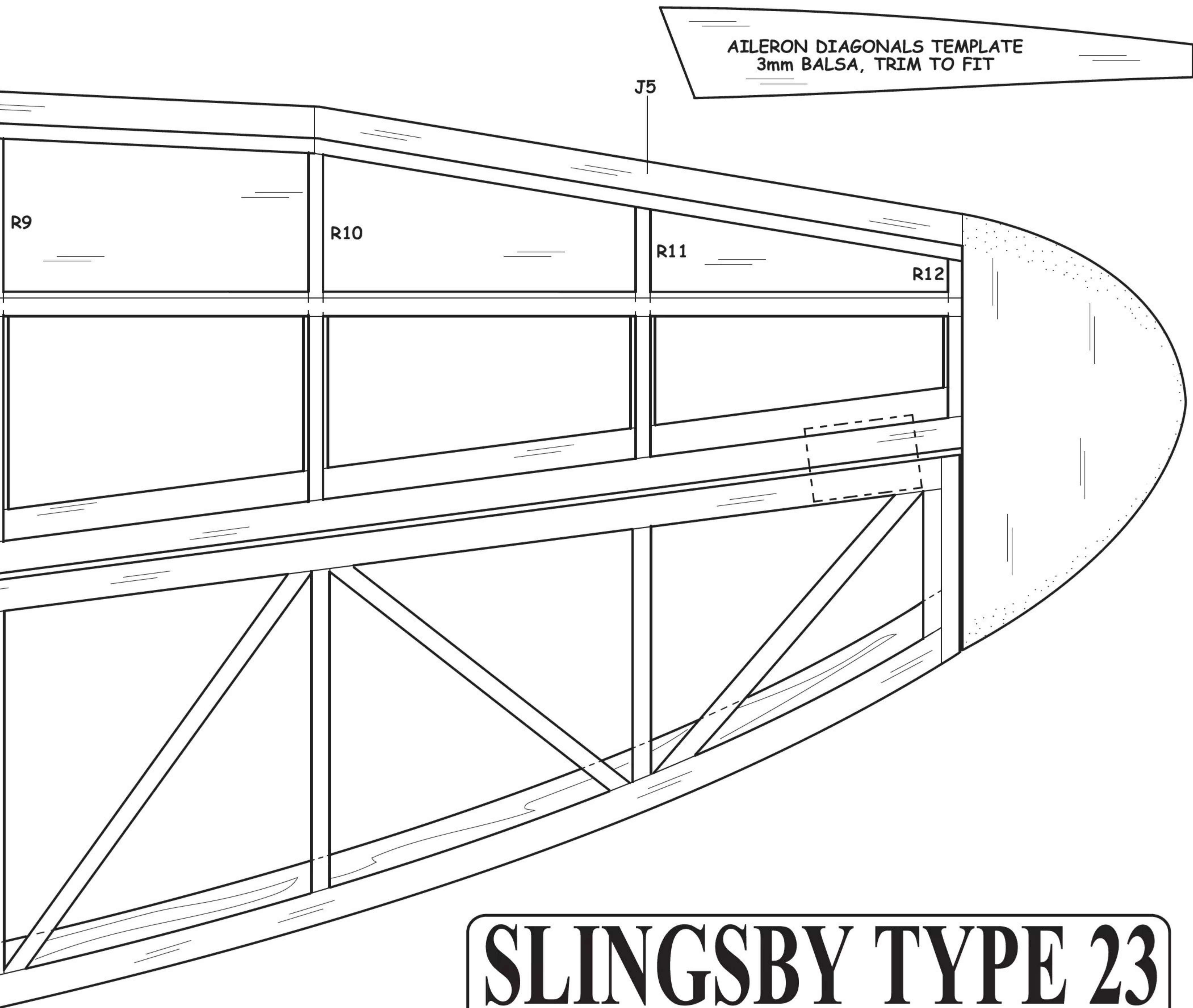
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AILERON DIAGONALS TEMPLATE
3mm Balsa, trim to fit

SLINGSBY TYPE 23 KITE

BY CHRIS WILLIAMS

PLAN No: RC2265

No. OF SHEETS: 4 OF 4

First published in
RCM&E September 2024

ICAL LENGTH 310mm

STRUT DETAILS

nm x 4mm T.E. STOCK

Ø4mm CARBON TUBE

J3

3mm METAL CLEVISES
ATTACH STRUTS TO AIRFRAME

WINGS RETAINED WITH INSULATING TAPE
ON TOP SURFACE ONLY

R1A

R1B

R1

R1

3mm SQ.
SHEET SUPPORTS

AILERON T.E.

SCALE
MM

100

200

