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SLINGSBY SAILPLANE

VOL. 68 NO. 7 JULY 2025

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RCM&E

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Welcome

Welcome to the July 2025 issue of RCM&E.

Modellers can be a crafty lot and I've heard of myriad ways in which new kits, engines, radios and other expensive items have been snuck past seemingly unaware wives and partners, especially those who do not share our fascination with this fabulous hobby.

My own poor wife has long given up on holding the fort against the intrusion of all sorts of modelling paraphernalia into our home and I can't say I really blame her, especially as my simple retort when she finally snaps is, "It's all part of the job!"

However, it appears that I do need to be a little more careful not to reveal too much within the pages of the magazine about what's going on in my head modelling wise. You see, my better half shocked me the other day with the revelation that she still likes to flick through the latest issue, after many years of me assuming she wasn't really interested in anything between the covers. Of particular interest was my recent revelation on this very page that the covering on a long-stored model had not aged too well, which only reinforced her firmly held opinion that I hold on to some models for far too long.

And in that she has a very fair point, my nearby storage unit being far too full of model aeroplanes, some of which date back to my first incarnation as editor of this fine publication in the early 1990s! So, I had to think fast on my feet and came up with the snappy reply, "Well, it's all part of the job!"

I think I need a new catchphrase!

Now for our usual quick look at some of the main articles in this month's magazine. Nigel Cartwrights starts things off with his review of the revised SE5a kit from E-flite which now incorporates AS3X gyro technology. Next is Shaun Garrity's latest 'Retro Ramblings' column in which he pays tribute to Dave Hardaker, well known to many long-time readers for his Lightning aerobatic design. Jeff Barringer is back with another informative article on safe flying, this time describing how to lower the risk of allowing a model to stall or spin when flown in windy weather. David Ashby's 'Just For Fun' column sees him have lots of fun when flinging his Tomahawk flying wing off a local slope, plus he shows how to convert a tiddly Texan RTF model to operate using a high-



quality Futaba transmitter. In 'Aerobatic Scene' Keith Jackson reports from the first BMFA centralised F3A competition of the 2025 season, then it's over to Chris Williams who fills the pull-out Pro-Plan spot for this issue with Part 1 of his 1/5th scale Slingsby Skylark 1 glider.

I've decided to join our regular contributors with some occasional scribbles of my own based on forthcoming reviews and my own pet modelling projects. I've named this feature 'Read The Flippin' Manual' as a sardonic twist regarding kit instructions, which appear to be an endangered species these days.

We then catch up with Dave Goodenough who has installed some new budget priced tools in his 'One Man' shed. This is followed by Gerry Edgar whose simplified beginners' guide to R/C model flying will be welcomed by any new readers who may be struggling to understand the basics of this wonderful pastime. In a similar vein, Kev Scott follows up his recent explanatory feature on ELRS radios with a look at the EdgeTX operating system now being employed by several radio control manufacturers. Last, but not least, we return to David Ashby who puts the new Iwata Vault Kustom airbrush to work.

I hope you enjoy reading it all.

Happy Flying!

Kevin Crozier

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On the cover

Photo: Barry Atkinson

Nigel Cartwright has a soft spot for WW1 models, but their flying qualities can be less than ideal. Short noses mean the CG is difficult to achieve, with small tail areas, lots of drag etc. As such the SE5a is probably one of the easier types to model with its longer nose and reasonable size tail. Around 14 years ago the first E-flite SE5a was released. It was a good flyer but needed care when taking off. Eventually production ended but roll on to 2025 and there's a new version out, this time brought right up to date with the latest electronics to assist ground and air handling.





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BMFA NATIONAL CENTRE – THE YEAR AHEAD



The National Centre looking good from the air. Why not visit during 2025.



The Flyers Café when brand new in March 2024.

Manny Williamson, Centre Manager at the BMFA National Centre for Model Flying at Buckminster in Leicestershire, has sent in details of what visitors to the centre can expect to see, and events to participate in, over the next few months:

The BMFA National Centre for Model Flying has become an established facility and is now into its eighth year of operation.

The Centre is busy all year with events and activities taking place every weekend from March until late November, plus a good number of midweek events in the mix. The majority of events are 'open' types and provided the activity fits in with your interests and aircraft then a significant number are turn up and pay on the day. Of course, some events and, in particular, competitions require pre-entry, but this is usually indicated through the particular discipline's own information.

As well as event days there are plenty of open flying days (usually mid-week) when members can turn up and fly on a day ticket.

The best place to find out about events at the National Centre is the dedicated website <https://nationalcentre.bmfa.uk> which features all the latest information as well as the full 2025 Year Planner and a site status button so you can see the detail of each day's activity.

The Centre consists of a 40-acre flying site with a 350-metre grass main runway (plus a 150-metre cross runway), three grass control line circles with hard centres, a hard control line circle with safety cage and a tether car track. There is also a large hangar for events and overnight model parking, a campsite with toilet and shower facilities as well as fresh water supply and a chemical toilet disposal point. Charging facilities for electric aircraft are provided adjacent to the flightline and trollies are located in the car park to transport models and equipment to the flight line.

We also have the Flyers' Café which has become very popular and is open for breakfast and meals on most event days (indicated in the site status).

The range of activities we cover at the Centre becomes broader each year and as well as the model flying events we also run several large swap meets each year, which are very well attended. We also stage several auctions, usually aimed at collectors' engines and classic kits; these have also proved very popular with sold items shipped internationally.

The best way to see what's on is to visit the website but below are a few highlights coming over the next few months:

June 20 – 21 Jet Modellers Association Fly-in, CLAPA Control Line Aerobatics Champs, tethered car meeting, all open to spectators.

June 28 - 29 Festival of Scale, scale fly-in hosted by the BMFA Scale Technical Committee with scale related advice on building, finishing, flying and competing, plus relaxed flying both days.

July 11 - 13 Warbirds Festival, open warbirds fly-in, themed slots and a relaxed atmosphere with some of the best warbirds in the country on display. Foamie slots throughout the weekend. Also, a tethered car meeting and a control line combat competition.

July 25 - 27 Blades over Buckminster, a weekend of all things helicopter and multirotor.

August 1 - 3 Laser Engines and Best of

British Fly-in, relaxed 'off the peg' format. If it's got a bit of British in it then come along. Trade presence and evening flying.

August 23 - 25 Silent Flight Nationals, gliding and soaring competition at its best, organised by BARCS.

August 29 - 31 Control Line Nationals, a whole weekend dedicated to control line competitions.

September 12 – 14 R/C and C/L Scale Nationals, the best of the best, spectators welcome and Flyers' Café open all weekend.

September 27 – 28 Aerotow, large gliders and tugs. Tows available all weekend. Hosted by the Ghost Squadron.

October 11 - 12 SAM 35 Autumn Gala, vintage fly-in, F/F, C/L and R/C, open event. Flyers' Café open all weekend.

October 12 Swap Meet, last swap meet of the year. Over 60 indoor tables plus outside stands. Booking required to trade.

November 7 - 9 Collectors' Model Engine Auction, in the Goldsmith Hangar and broadcast live online. The ultimate engine shopping experience.

Check out the website for full information and detail on all our events at the National Centre. Enquiries to manny@bmfa.org or 0116 2441091.

We look forward to welcoming you to the BMFA National Centre.



What a runway!

MONTROSE MODEL AERO CLUB

Graham McIntosh writes with details of a long-established model aero club in Scotland. Graham is the Hon. Sec. of Montrose M.A.C.:

The Montrose Model Aero Club was formed in September 1944 by a group of local air-minded youths. It was reported in the December 1944 Aeromodeller as a new club. In the May 1955 Aeromodeller they reported that Montrose M.A.C. had an enjoyable Social Evening with a review of activities in 1954 and then a film show. Also reported was that Ken Whyte's 80" model was being test flown

During the Fifties and Sixties, the Club was prominent in the Free Flight leagues, flying at sites such as RNAS Abbotsinch, RNAS Condor, Edinburgh Airport, and Prestwick, winning several trophies and getting regular mentions in the model magazines of the day. The Club had a local supporter in those days, in Councillor Glory Adams, who was a great promoter of it.

With the increasing use of multi-control R/C models in the late 1960s and early 1970s the Club, which was then flying mainly on the local public golf course, decided a new site was needed. When the old 1913 RAF Montrose became available for use, as packets of land were sold off to industry and the Council, a more permanent area on the Council site was acquired.



Montrose M.A.C. fly from Council land that became available when RAF Montrose closed. The Club still fly there, operating the usual mix of current styles of model.

The Club still fly there, with the usual mix of current styles of model, and have an annual fly-in on the last weekend of July every year.

Thank you for taking the time to send in details of your club, Graham.

If you would like to see your own model club featured in Switch On then please send us some information on its activities, past



Here's Dave Socha with his turbine powered T-33. The Shooting Star is by HSD Jets using Futaba S-bus radio. Turbine is a Swiwin 60 converted from brushed starter to brushless at the factory - bit different from Graham's old Jetex 50!

and present, plus some good quality high resolution pictures. Pictures should be sent as the same size as they are taken on your camera or phone. Unfortunately, we get a lot of pictures that are reduced in size for use on club websites, but they are invariably too small to publish. Keep the size up, keep them sharp and they should work well.

PATTERNSY PLANS

Mark Townsend writes in with details of a new plans printing service:

Patternsy is Su & Mark, and we have been doing large format printing for quite a few years starting with, believe it or not, marketing and promotional materials for Beanie Babies!

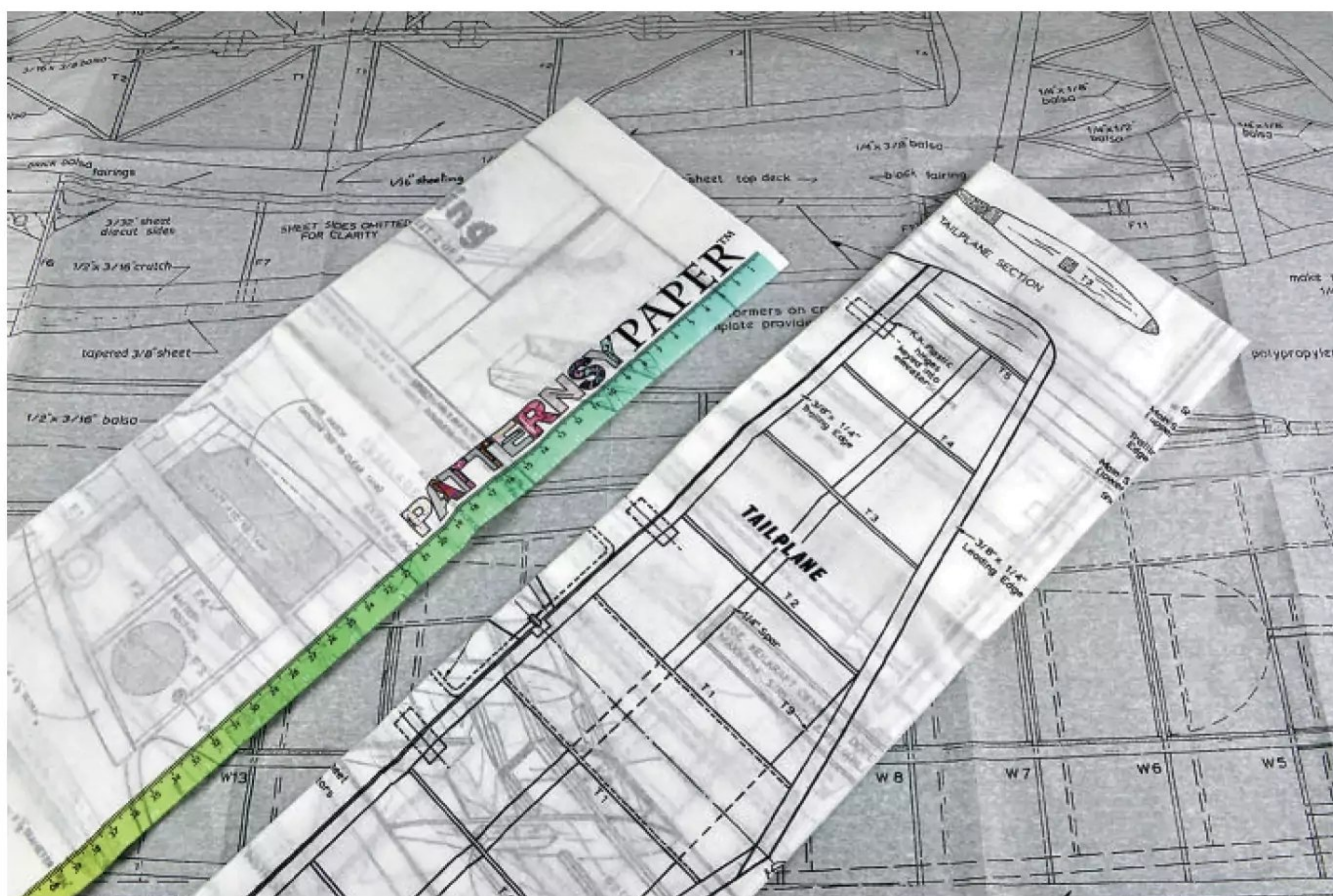
Beanie Babies came and went (then came back a couple of times!) but we had the skills and the bit between our teeth! We moved from Yorkshire to Lincolnshire, to the village Su was born in, and switched to... sewing pattern printing. We are now adding other large format printing niches.

Consider the ubiquity of the humble PDF, (V1.0, born 1993) and now so much a part of everyday usage in documents, diagram drawing, plans etc. What a time saver! PDFs can be stored and retrieved on almost any device.

Well, that's true to a point in the mundane word of A4, A3 and other small formats, but what about aircraft modelling. How many hours have been spent collectively by aeromodellers sticking A4 or A3 sheets together, either digitally or with sticky tape!

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SE5a

Nigel Cartwright assembles the latest version of E-flite's biplane fighter, this time brought right up to date with the latest electronics

Words: **Nigel Cartwright**

Photos: **Nigel Cartwright, Barry Atkinson**

The Royal Aircraft Factory SE5a probably won't need much introduction to RCM&E readers. Becoming operational relatively late in WW1 it was one of the fastest fighters of the era and was instrumental in gaining air superiority in the closing stages of the conflict. Powered by either a Hispano-Suiza 8 or Wolseley Viper engine with either two or four blade props, both engines were water cooled leading to the type's distinctive nose radiators. Interestingly it was designed in part by one Henry Folland, who went on to form the Folland Aircraft Company which produced the Gnat jet trainer.

I've always had a soft spot for WW1 era aircraft, but their design often means the flying qualities of model versions is less than ideal. Short noses mean the Centre of Gravity is difficult

to achieve; small tail areas; lots of drag - the list goes on. As such the SE5a is probably one of the easier types to model with its longer nose and reasonable size tail feathers.

SCOUT REBORN

With the above issues in mind if anyone can get a small SE5a to work, Horizon Hobby can, so around 14 years ago the first incarnation of this design was released. It was, by all accounts, a very good flyer, but like a lot of tail-dragger biplanes it needed care with ground handling and take-off. Eventually the production run ended and new models took precedence, but as Horizon have done before models are often updated and re-released. Roll on to 2025 and there's a new version out, this time brought right up to date with the latest electronics.

The basic specs are 35.4" (900 mm) span, 28.2" (715 mm) in length and with an empty weight of 38 ounces (1084 g). The model is all made from EPO foam with local plastic reinforcements. Power comes from a 1100 kV brushless motor driven by either a 3S or 4S 2200mAh LiPo battery via an E-flite Avian 45A 'Smart' ESC. It comes with the usual choice of Bind N Fly, ready fitted with a Spektrum receiver, or Plug N Play, ready for you to fit a receiver of your choice. Spektrum A345SL 9-gram digital servos are fitted all round. The model is a handy size, big enough to handle reasonable weather but compact enough to fit in the car assembled.

OPEN THE BOX

The model comes safely packed in a typical polystyrene box and while you'd think a biplane



There's no problem with visibility and orientation in these conditions!

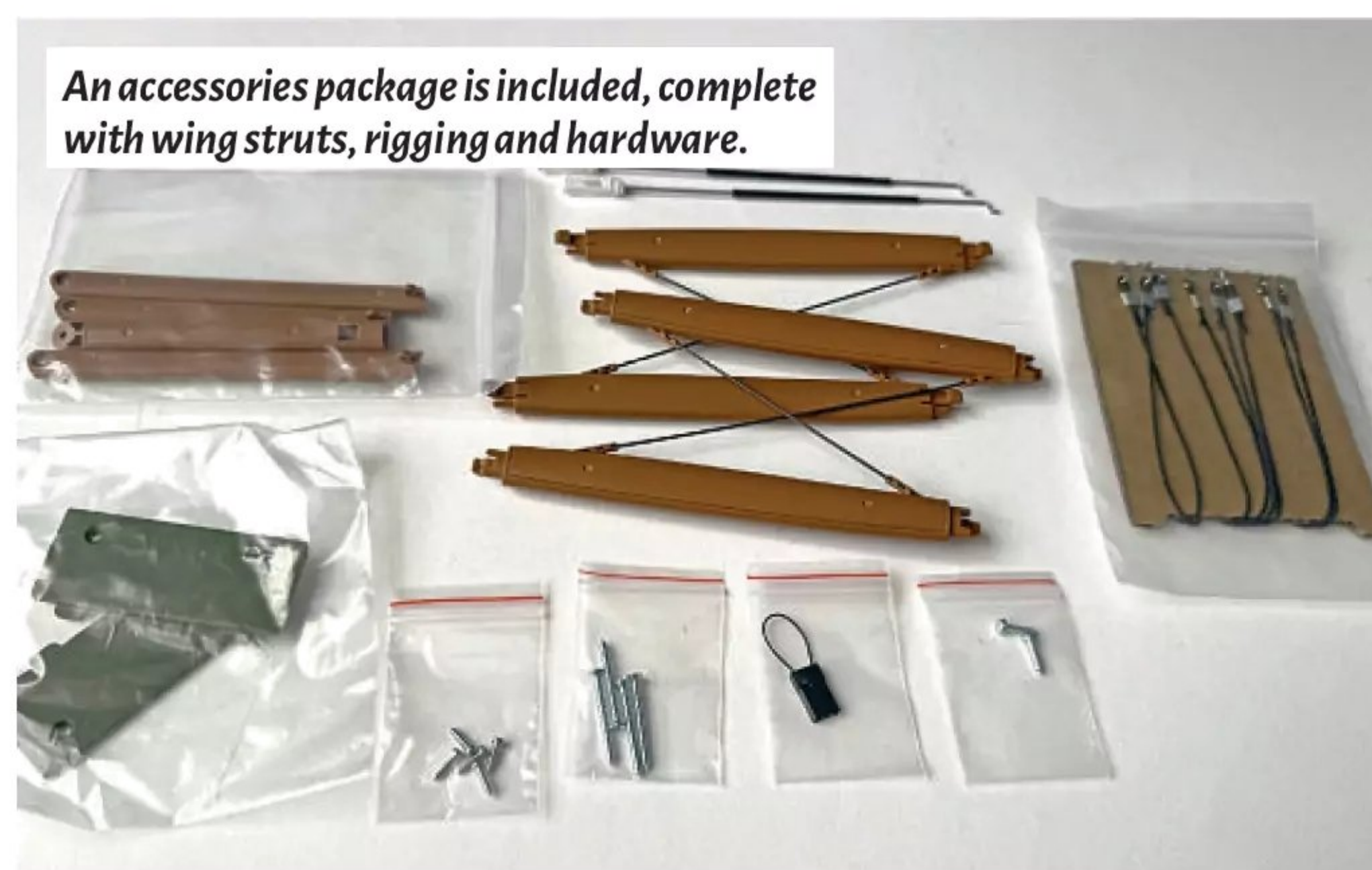


Scale appearance of the SE5a is spot on.

“Horizon Hobby has a knack of making their models look detailed without adding a lot of parts which will break”

would take a while to put together, assembly is simple and well thought out. The lower wing and undercarriage are screwed in place with four screws and a pair of reinforcing plates, having first plugged in the aileron servos. The cabane struts are screwed to the fuselage sides, while the interplane struts have clever clips on each end; these clip into small 'sockets' mounted on the wings. The top wing then clips onto the struts, adding a pair of wire pushrods which link the upper ailerons to the servo-driven lower ailerons.

The flying 'wires' don't add anything structural to the model and are for show only. They are made from elastic thread with a small wire hook on the end which hooks into moulded lugs on the struts and fuselage. They are quite



An accessories package is included, complete with wing struts, rigging and hardware.



The undercarriage is very sturdy.



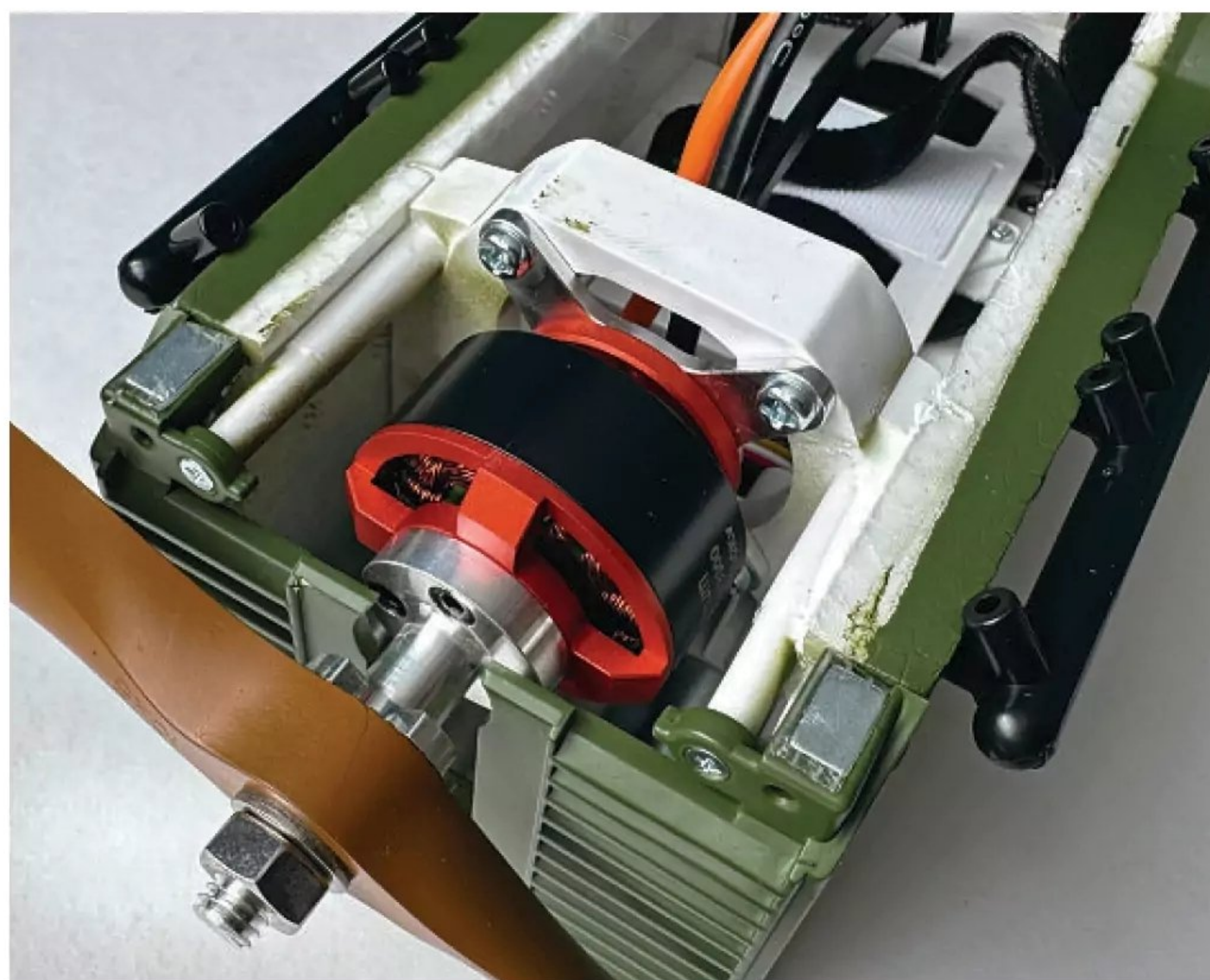
Horizon have gone to town on the surface detail. Note the rib tapes. There's a small tailwheel mounted inside the skid.



Lower wing and undercarriage are retained with a pair of screwed on plates.



Wing struts have clever clips to hold them in place.



An 1100 kV brushless motor provides the power.



Under the front hatch. Note the Lewis gun stored for transport.



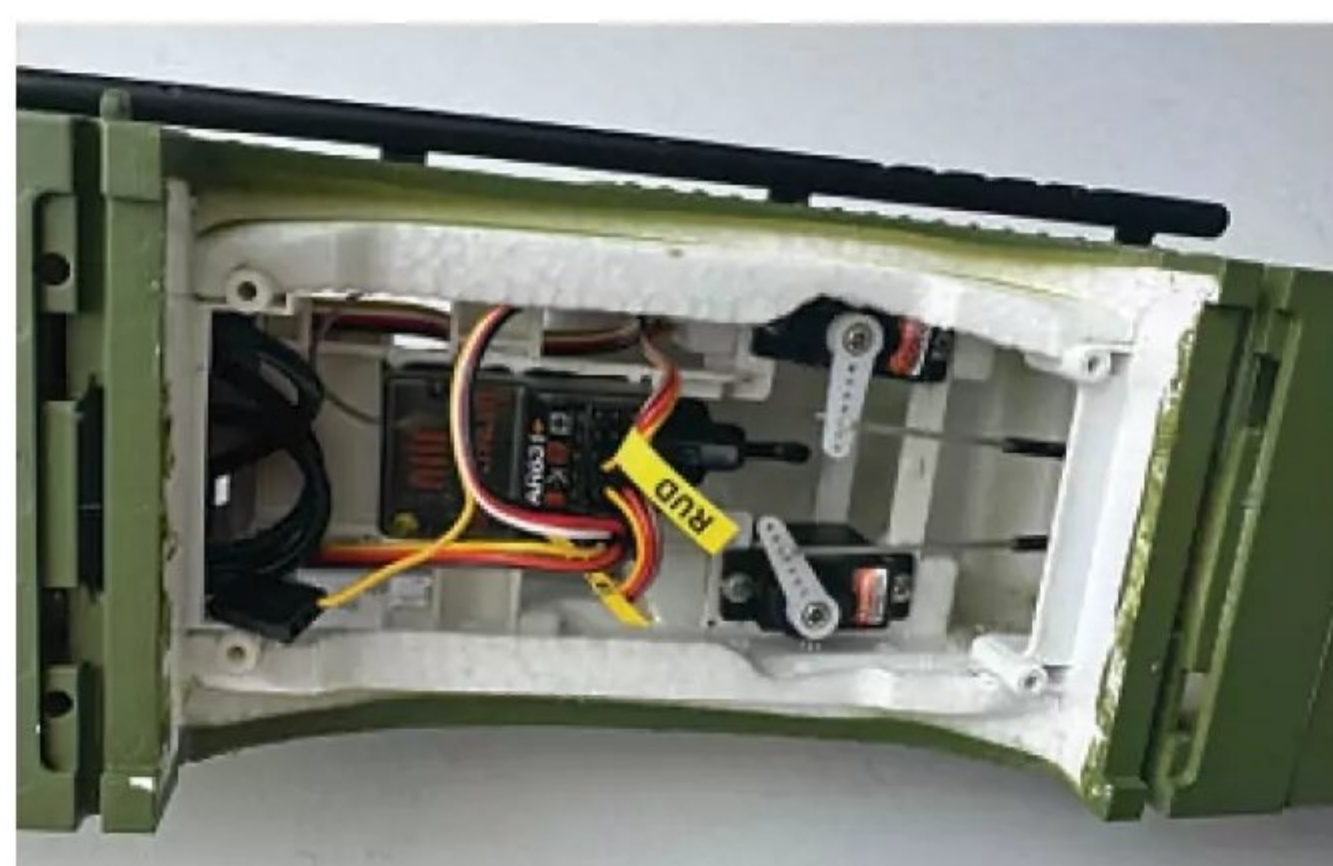
Elastic flying wires hook on to moulded loops on the struts.



The wing mounted Lewis gun is very convincing in the air.



Biggles even comes with a 'silk' scarf!



The model is fitted with the latest Spektrum AR631 receiver.



There's a bind plug socket mounted behind the motor in the battery bay.

convincing. Three screws attach the tailplane and fin/rudder, and that completes the airframe. The Lewis gun comes clipped into the battery tray for safe keeping; this simply pulls out and is then clipped to the top wing.

Horizon Hobby has a knack of making their models look detailed without adding a lot of parts which will break or go missing. The level of detail on the SE5a is just right, with the aforementioned Lewis gun, as well as a

"If I can give one tip, it's to use the throttle! I see a lot of scale models flown round at constant throttle settings"

Vickers gun fitted to the fuselage top. The engine, radiators and exhaust are all accurately shown. The foam surfaces are detailed too, with the wing ribs and fuselage fabric

stitching realistically shown. Even Biggles has a fitted scarf!

LATEST AVIONICS

The SE5a comes fitted with the latest receiver technology, in this case the 6-channel Spektrum AR631 with AS3X and SAFE.

A quick explanation. AS3X refers to the 3-axis gyro stabilisation which smooths out the effects of turbulence and wind gusts. SAFE goes a step further and sets limits on the model's pitch and bank angles and enables auto-levelling - let go of the sticks and the model returns to and holds level flight. The function can be assigned

to a switch on the transmitter to disable it if you want. The AR631 can also provide telemetry to suitable 'AirWare' equipped transmitters.

If you have one of the latest Spektrum Smart transmitters you can simply turn on the radio and the receiver will magically send all the settings for the model to the transmitter. As I'm using a 'steam era' DX9 Black I had to set the model up in the transmitter in the old-fashioned way, although it's only a few minutes work.

At this point I hit what appeared to be a bit of a hitch. The receiver is bound to the transmitter either by pressing the bind button

on the receiver or inserting a bind plug into the bind port on the receiver. All well and good but having assembled the model the receiver is out of reach! After some head scratching and poking around the battery bay, I realised that there was an extra extension lead plugged into the receiver heading forward to a socket fitted in the engine mount behind the motor. Strangely, there's no mention of this in the manual, but a quick online search showed that others had been through this process before and this is indeed the bind port.

As advised, I set up dual rates for the ailerons and elevator channels. It's also possible to set up thrust reversing to help taxiing and shorten the landing roll, although I decided to pass on this less than scale feature!

Before binding you need to decide how the gyro system is set up; the point you remove the bind plug (before or after initiating bind on the transmitter) dictates whether SAFE is on permanently, AS3X is on permanently, or you assign a switch to toggle between the two modes. I chose the latter to give both a try. One can always re-bind later to lock the model in either mode.

Battery choice is next. The SE5a can run on 3S or 4S 2200 mAh LiPo packs. The marketing seems to show that you use 3S for scale flying and 4S for, shall we say, less scale flying, including prop hanging and other wild manoeuvres! I decided to start off with 3S and see how it goes! The ESC comes fitted with an IC3 connector but as all of my batteries are fitted with XT60 plugs, I did a quick swap. The battery fits easily under the



Dusk patrol! Waiting for the maiden flight.

E-flite's SE5a is very docile on the ground and in the air.



SAFE mode limits the pitch and bank angles to prevent any wild excursions and ensures the wings level automatically when the sticks are released.



hatch on top of the nose and is retained with a pair of Velcro straps. The hatch firmly clips in place with magnets.

FIRST FLIGHTS

With that all done it's off to the flying field. Having watched a few videos of the first incarnation of the model, and then the marketing videos of the current model, it became obvious that the early version needed care on take-off to keep the model tracking straight and avoid nose overs. It's apparent that the AS3X gyros are doing their job as the first take off was a complete non-event. Just point into wind, open the throttle and before I got much above half stick the model was flying. Throttle back, a couple of clicks of elevator trim and the SE5a was cruising round. The instructions mention that it's important to not touch the sticks for three seconds after trimming to allow the AS3X to recognise the new trim value.

Most biplanes need some rudder input in turns and while the SE5a does turn better when leading into the turn with rudder it will turn with just aileron and elevator, but it tends

to look a little odd as the tail end eventually follows the model around. I ended up mixing a bit of rudder to the aileron channel and found this was enough to keep the tail in line after manually adding in some more rudder to start the turn. On a 3S battery the model is quite happy at around half throttle, using just a bit of extra power in the turns to keep the drag at bay.

I found the usual aerobatics are all possible, but I keep it scale with plenty of lazy-eights, wingovers and low passes down the strip. The whole point of a model like this is to stooge around at low level enjoying the scale outline and atmosphere. The SE5a has real character and looks spot on in the air.

If I can give one tip, it's to use the throttle! I see a lot of scale models flown round at constant throttle settings. While this might be okay for a jet or a big warbird, models like this need to be flown in a scale manner. Use the throttle in the turns to keep the tail following round, throttle back for low passes and power out into a climbing turn - it's much more realistic. The SE5a will stall but it's very benign so just keep the speed up in the turns.

I'm not normally one for having gyro assistance in models, preferring the raw feel of flying the aircraft, but the AS3X is really transparent. There's no twitching or odd behaviour sometimes seen with fixed wing gyro systems; it smooths out the flight path, but you can't tell it's doing it.

Switching to SAFE mode, on the other hand, is more 'intrusive', limiting pitch and bank angles to prevent any wild excursions. It also ensures the wings level automatically when the sticks are released. It's very clever and might be useful for the less experienced flyer but I prefer the raw feel of AS3X.

In the interests of just seeing what the difference is I also tried flying with a 4S 2400mAh LiPo pack. There's obviously a big increase in power - the take-off roll is down to about six feet! At full stick the model will climb vertically forever and will do any aerobatic manoeuvre in the book. But the model is also now heavier, faster and a lot less scale like, which for me defeats the object of having a model SE5a. I'll buy a Pitts Special to do this kind of thing. So, it was back down to earth, swap back to a 3S pack and normal scale service was resumed!

AS3X refers to the 3-axis gyro stabilisation which smooths out the effects of turbulence and wind gusts.



Author and the SE5a. It's just the right size to transport fully rigged.



I had set the transmitter timer to six minutes, as per the manual, and then found I still had 40% left in the battery. So you should be okay for at least seven to eight minutes of scale flying.

PHOTO SHOOT

I arranged to meet up with the Editor and Barry Atkinson at their local strip to take some photos. The club have a lovely field with a choice of grass runways. It was very easy to take off into wind,

then fly up and down the other runway across the wind while Barry did his stuff, a few gentle figures of eight and wingovers being enough to catch the photos shown here. Everyone who saw the model on the ground and in the air was suitably impressed. A big thank you to the PPMFC for the visitor's pass!

WORTH THE WAIT

For the more creative flyers out there the SE5a offers a canvas for adding more detail.

The 'wood' parts, the prop, wing struts and undercarriage are all moulded in a light brown plastic so painting 'wood grain' on these would be a relatively easy task. A bit more detail could be added around the radiator and guns, and maybe the cockpit too.

It might have taken a while for Horizon to bring the SE5a back into production, but it was well worth the wait. The scale appearance is spot on, it looks good on the ground and in the air. While some WW1 types can be a handful, any flyer with a bit of experience will have no problems at all with the model's viceless handling. It's a great addition to the fleet. Maybe Horizon could do a Sopwith Camel next, or even a German Albatros D.V!

The E-flite SE5a is available from your local model shop. The recommended retail price for the BNF version is £319.99, while the PNP version is £299.99. ■

DATAFILE

Model:	SE5a 900mm
Model type:	ARTF biplane
Manufacturer:	E-flite https://www.e-fliterc.com
RRP:	£319.99 BNF, £299.99 PNP
Length:	715 mm (28.2")
Wingspan:	900 mm (35.4")
Weight:	10840 g (38 oz)
Motor:	1100 kV brushless outrunner
ESC:	45A
Servos:	9 g x 4
Functions (servos):	Ailerons (2), Elevator (1), Rudder (1), ESC
LiPo:	3S - 4S 2200 - 3200 mAh



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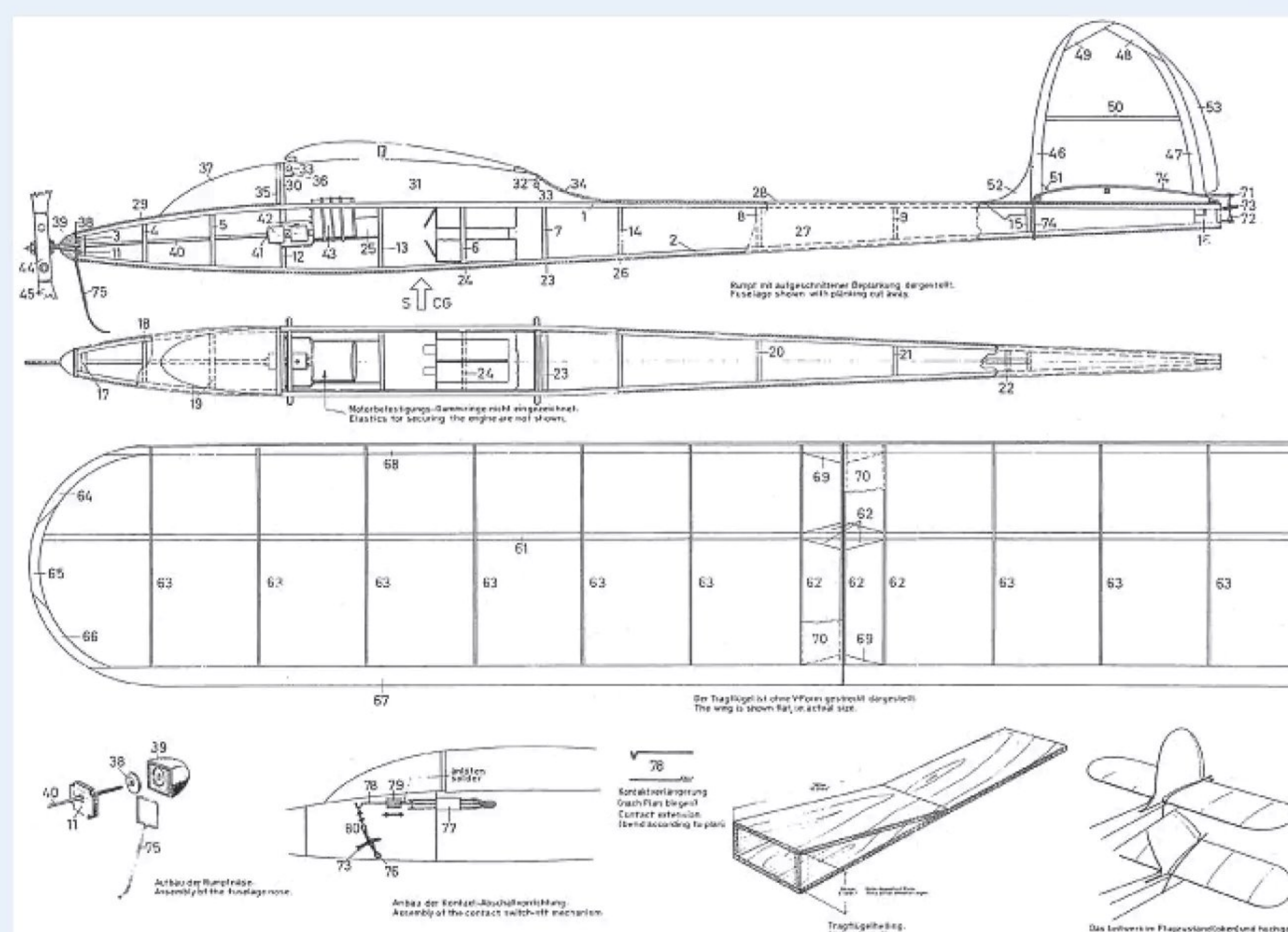
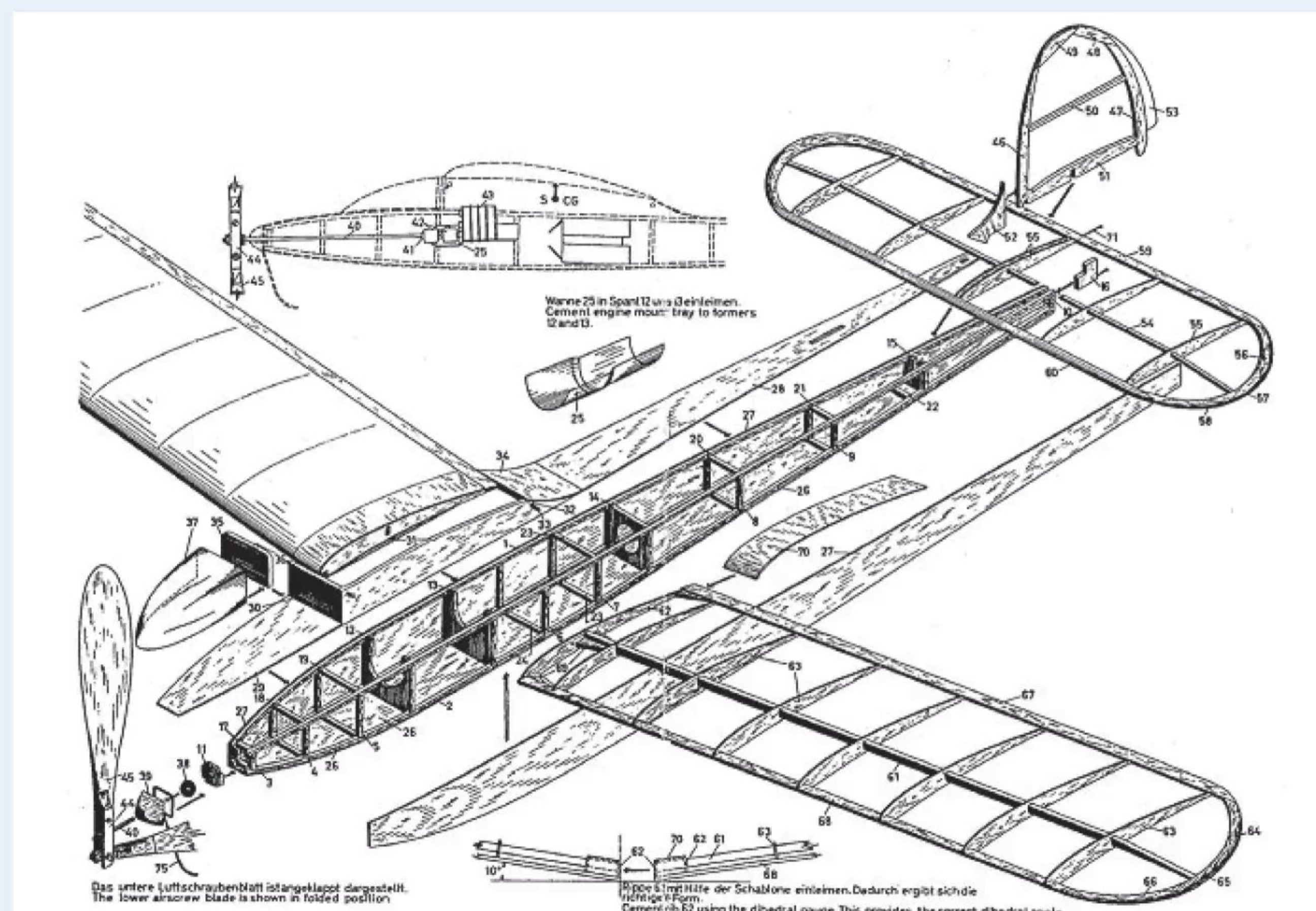
Dave Hardaker's fabulous fully glassed Kwiksiver mentioned later in this article. The outstanding finish and precision of the build makes it hard to believe this isn't a fully moulded model. I would guess Andy Brewster was involved with finishing it.



ELECTRIC PIONEER

This time Shaun Garrity looks at one of the pioneers of electric flight and remembers one of the UK's leading aerobatic pilots from the 1970s

Words & Photos: **Shaun Garrity**



Fred Militky's Silentus was the first commercially kitted electric powered model that was truly successful.

FRED MILITKY

'Fred who?', I bet many of you will be saying. Well, Fred Militky could be considered the father of electric flight. Back in the late 1950s he designed a free flight model called the Silentus which was truly extraordinary at the time. Other modellers had dabbled in the field but this was the first truly successful electric powered model that would repeatedly perform as designed.

Here in the UK, Colonel Taplin recorded the first official flight of an R/C model with his Radio Queen on the 30th of June 1957. I've seen a short film of it going up for a few seconds but never saw it landing in one piece. (But I'm not saying it didn't happen!)

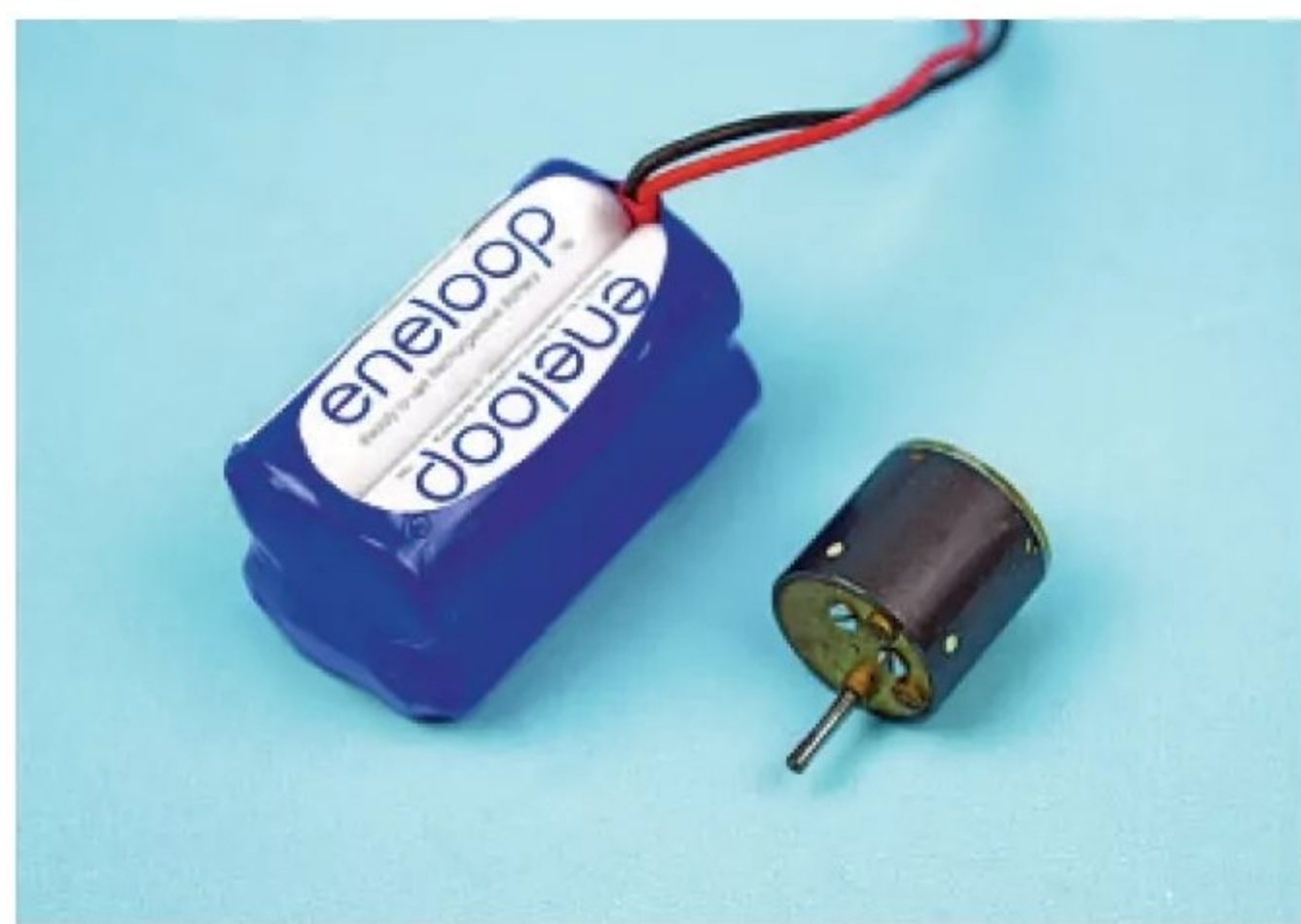
Probably Fred's most noted model design was the Hi-Fly, an R/C twin, brushed motor powered glider, kitted and sold by Graupner in 1973.

He was also involved with a full-sized electric powered single seater aircraft called the MB-E1 (Militky-Brditschka Electroflieger 1). Having a 12-metre wingspan and, I believe, an 8000-watt Bosch motor with Varta batteries, it achieved a world first maiden flight in Austria of nine minutes, reaching almost 1000 feet in height, on the 21st October 1973. The original MB-1 was restored in 2017 and exhibited at the Austrian Aviation Museum in Graz-Thalerhof from 2018.

Technically this wasn't the first electric powered aircraft to fly. A hydrogen filled dirigible flew in France in 1884 and won a 10 km race around Villacoublay and Medon. It was electric powered because at the time the only other option was a steam engine. As soon as a suitable internal combustion engine was developed electric powered aircraft were a non-event for about 90 years.

I can't believe its two months since my last column but I've had a busy time visiting my goddaughter in Aberdeen for a week (and getting some cheeky flying in under the thinly veiled excuse of entertaining her two young boys) and then scooting off to Sweden to catch up with Tobe, whose model designs, 3D printed sticks, Galloping Ghost actuators, servos, cases, transmitters etc. I've previously featured in my column.

Anyway, less waffle as I need to get this article finished for Kev. Hopefully I have another mixed bag of interesting chit-chat for you again.

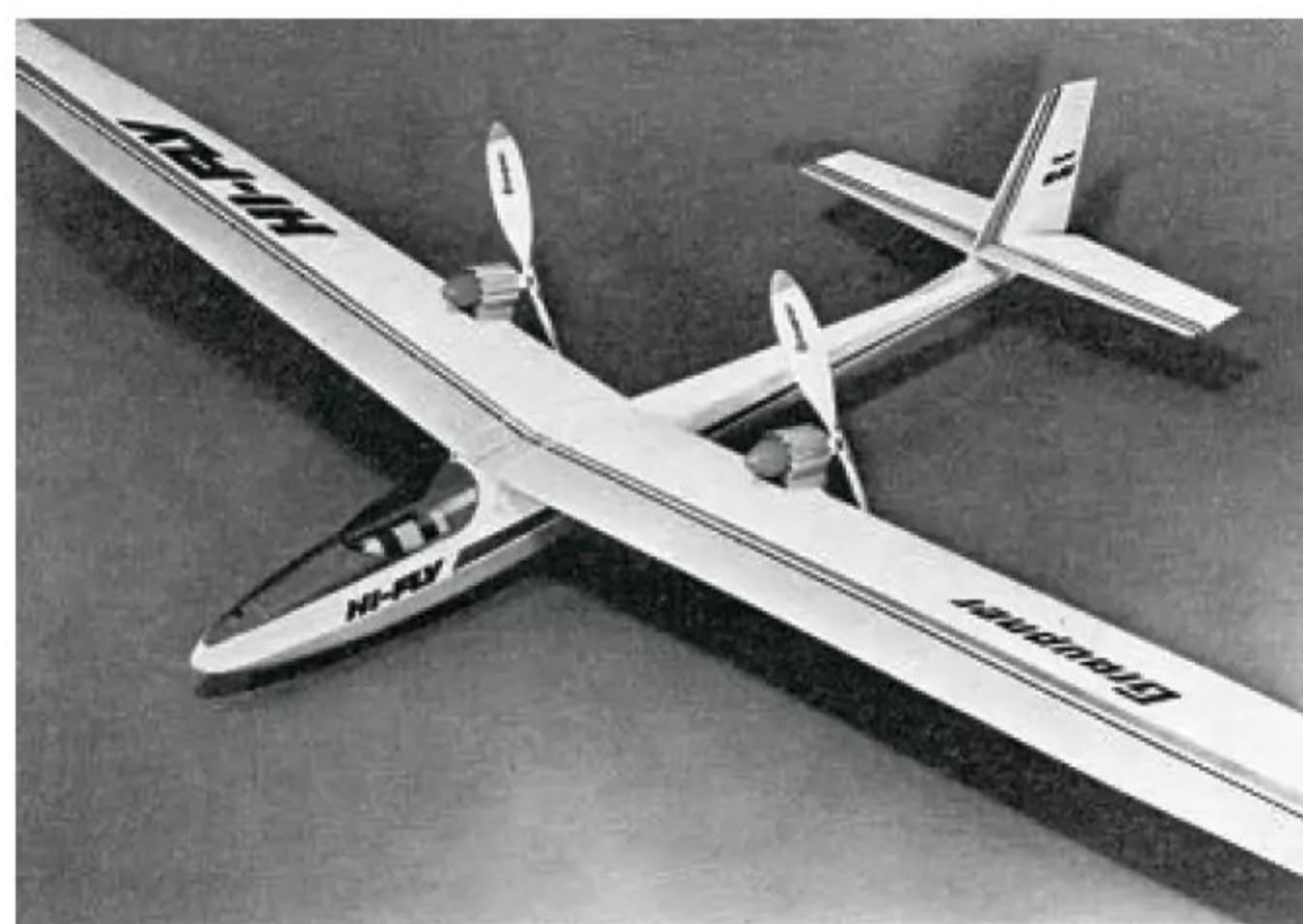


This tiny Faulhaber geared motor is exceptional and similar to the one used in the Silentus. Faulhaber motors were used widely in applications ranging from R/C servos to precision industrial products. They are still around today, I believe.

Fred's last project in 1976 was a solar powered collaboration with Hilmar Bentert and the Graupner team called the Solaris. This model used US manufactured solar cells; a single cell could deliver 0.45 volts / 250 mA so to get more voltage and current you simply added more cells in series/parallel configuration, just like you would with normal batteries.

The success of the project was down to a very efficient electric motor designed by Dr. Faulhaber called the MICRO. This highly efficient motor with a bell-shaped armature was used in many of the Graupner servos of the day. Hilmar was the designer of the lightweight pulse proportional set called the Webra Pico and following a meeting in Berlin in January 1976 and realising they shared the same passion for e-flight, he and Fred decided to partner up and explore designing a solar powered model, with Fred working on the airframe and Hilmar the radio and power system.

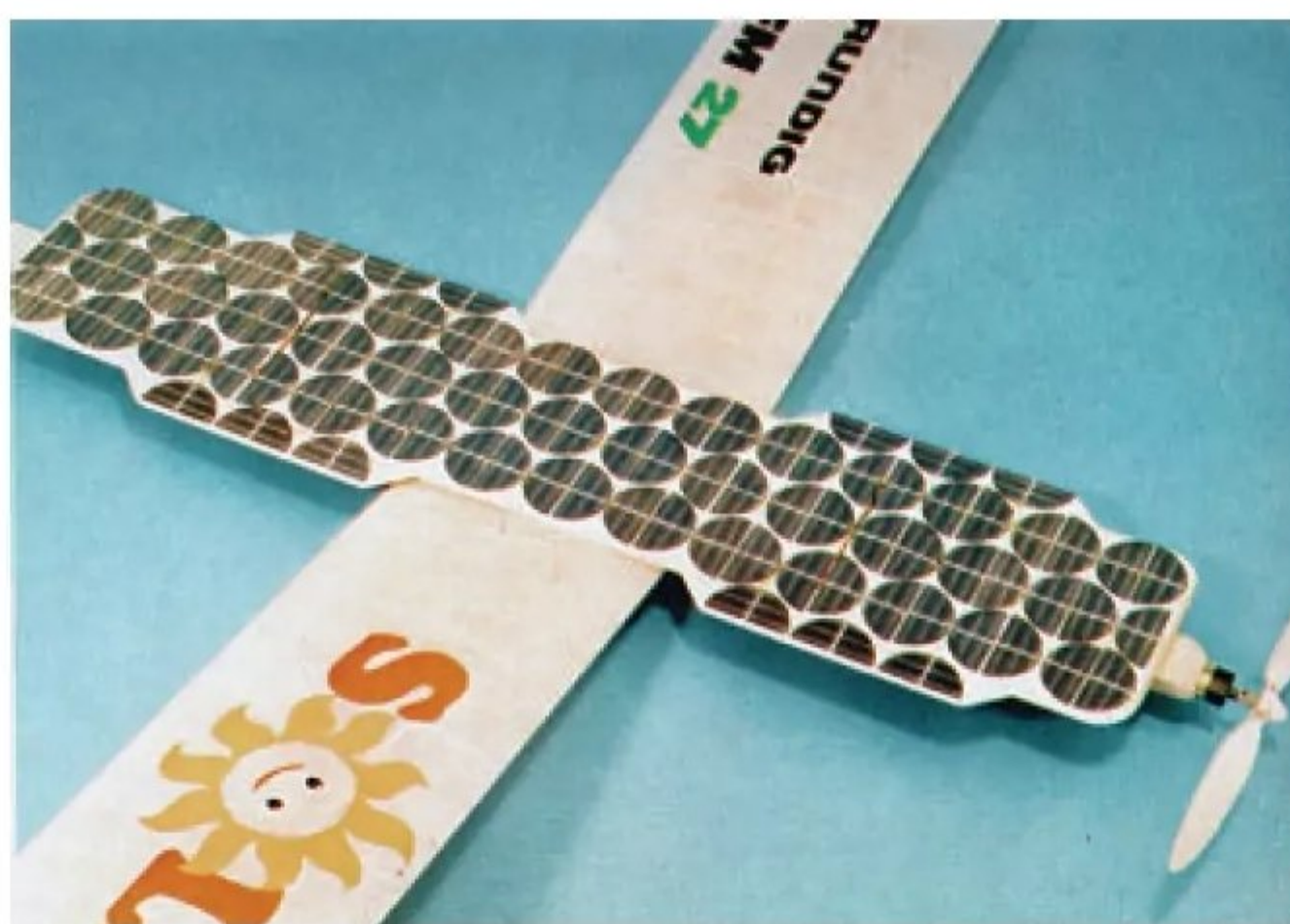
Initial flights were carried out using a small VARTA NiCad as solar cells of the time were



Kitted by Graupner, Fred's Hi-Fly was probably his most famous design. It proved that repeatable electric powered R/C flight was possible.



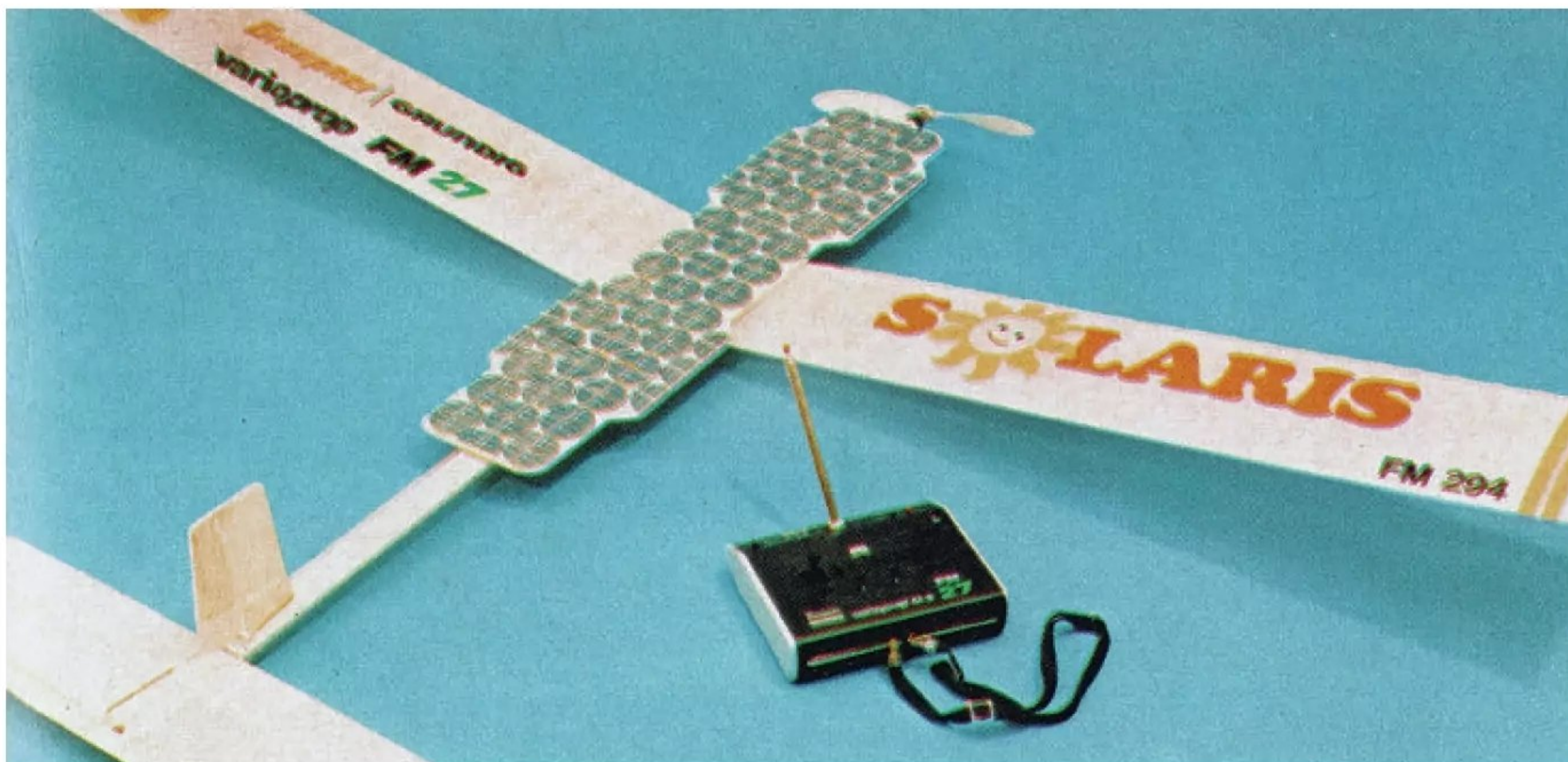
An example of modern-days solar cells. Flexible and much higher output than the ones Fred and Hilmar used. I've bought them to have a go at this form of model flight - yet another one to add to my ever-growing list of projects!



Solaris was Fred's swansong model and it proved that solar powered R/C flight was possible.



Co-designers of the Solaris project were Hilmar Bentert (left) and Fred Militky (right).



Graupner also partnered up with Fred and Hilmar, providing additional technical and engineering resource, plus the radio gear.

fragile and expensive. To get airborne quickly the original 'test bed' model used a set of wings and tail supplied by Horst Haendler, a European magnet steering expert and a master at building lightweight but strong models. It was a free flight model with a timer for the motor. Fred unfortunately fell ill and the project stalled for a few months, but Graupner brought in a few members of its design team to assist and keep the project on track. The design quickly evolved and more efficient solar cells were sourced, to a point where a two channel R/C version was built having rudder and elevator, with a link to an on/off switch for the motor. Graupner provided their

latest Grundig Varioprop 27 MHz gear and the final model weighed 21.375 ounces (605 g).

The successful test flight was carried out on July 31st, 1976. The weather wasn't ideal, with a heat haze reducing the sun's effectiveness and the odd cloud completely messing things up. But three flights were made of 2.5 mins each in the afternoon, achieving an altitude of 150 feet. It was a truly outstanding effort by the team. They could have made life much easier if they had used a small NiCad flight battery with solar top up, but easy was never on the radar for Fred and Hilmar.

As far as I know no plans are available other than the following data for the Solaris. But it



Midway through the Solaris project Fred became ill but he still managed to perform the test flight of the completed model.

achieved its goal of proving that solar powered model flight was possible.

Model: 2060 mm span, AUW 605 g. (of which 450 g was the solar cells and R/C)

Power system: Faulhaber Micro special motor, 96 solar cells with 10W max output

Radio: Graupner / Grundig Varioprop FM27

Interestingly Faulhaber still produce a vast range of high-quality precision micro-DC motors today.

For completeness, the first recorded instance of a solar powered R/C model I'm aware of happened on the 4th of November 1974 on a dry lakebed at Camp Irwin, California. The model was called the Sunrise 1 and was designed by Roy Boucher of Astro Flight fame. It flew for 20 minutes at a height of 100 metres. The wingspan was almost 10 metres, however this wasn't your typical model aircraft but a commercial feasibility venture. The model had just over 4000 solar cells and the output was a scant 450W. Many recorded flights of 3 to 4 hours were documented until the model was badly damaged in a sandstorm. A later version, Sunrise 11, was built in September 1975, this time with nearly 4500 solar cells and 600W output.

AUTOGYRO FIND

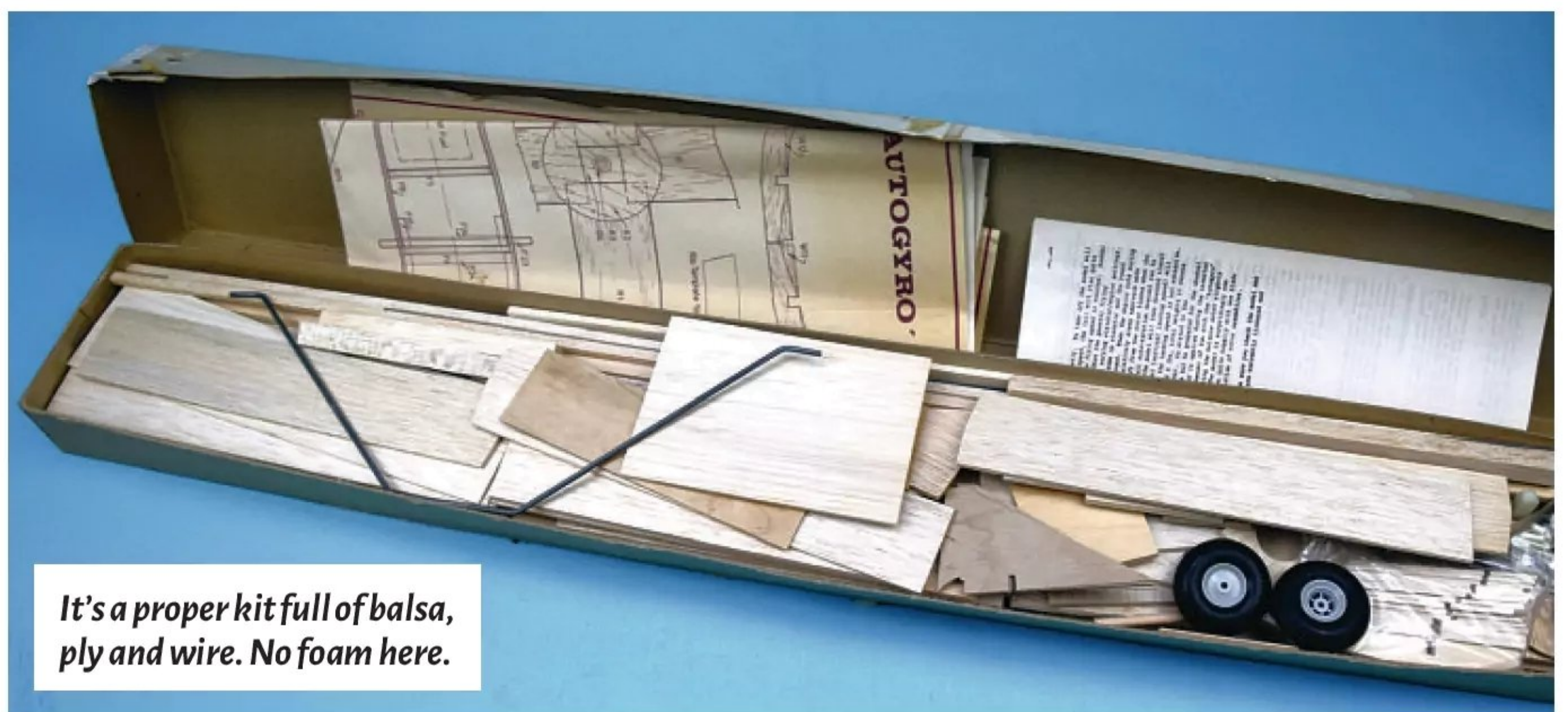
I recently came across an old DB Autogyro kit from 1975 and felt the need to buy it. This model has interesting memories for me.

Many years ago, I was down at the flying field when a pal asked if I would test fly his latest pride and joy for him. Never having flown a helicopter or gyro before, but full of teenage exuberance and over confidence, I immediately said, 'Of course'. I should have realised it wasn't going to end well.

The take-off was fine, the little O.S. Max 19 singing away and delivering the goods. The flight characteristics were different to a regular model aircraft, but things were going well - until... Why does there always have to be an until or but? Anyway, after five minutes of autogyro flight my brain was telling me I was now an expert, so I thought it prudent to try a loop... With insufficient speed (the motor sagged), it fell off the top of the loop, the rotors stalled and a lighting post surrounding the cricket pitch we flew from mysteriously appeared out of nowhere and selfishly decided to re-kit the model. My immediate reaction was to blame his gear and so I shouted, "Interference, I couldn't do anything!" So, Andrew, if you're reading this,



DB Models Autogyro. These were great fun and kits are still available from DB Sport & Scale Ltd. today if you fancy a go.



Autogyros became popular in the 1970s. There were several designs for free flight and R/C models. These examples were shown in the Aeromodeller Plans Book

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UNORTHODOX

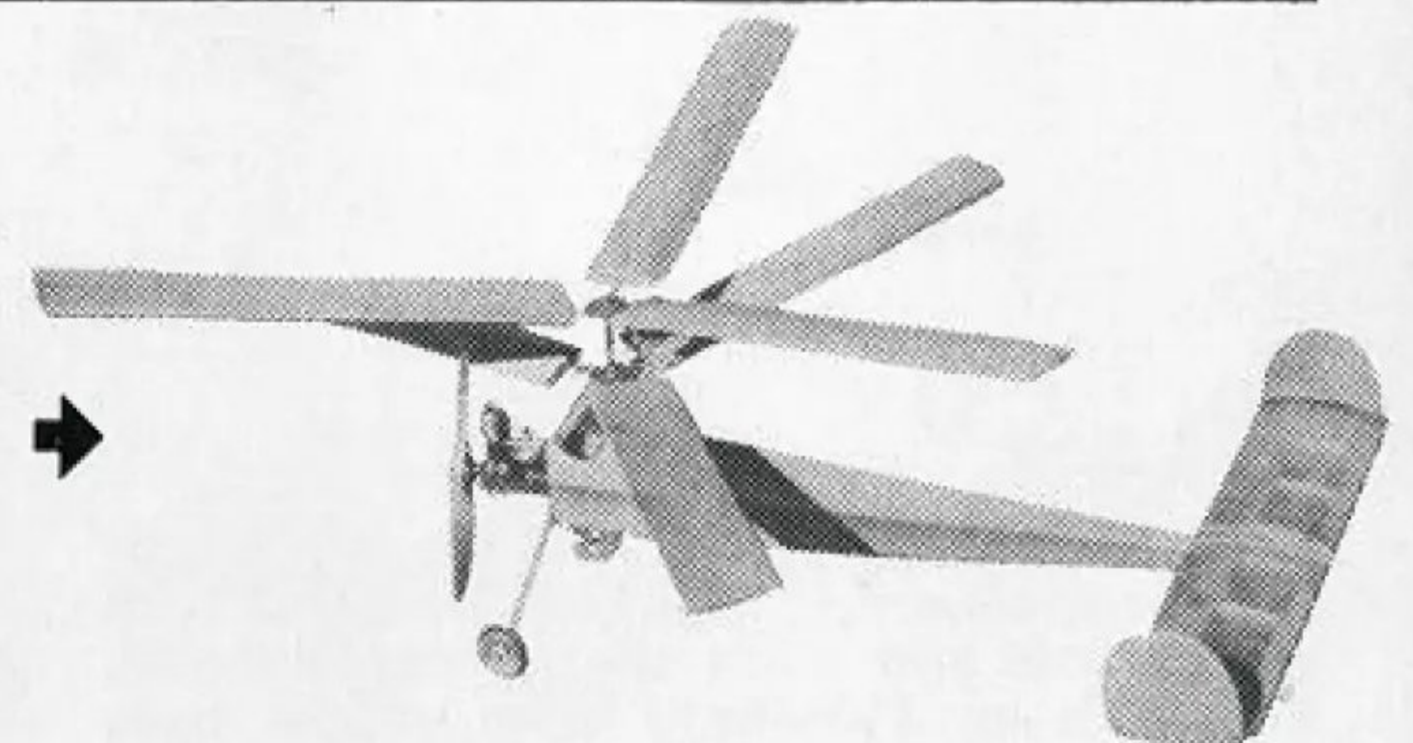
CONTRA-GYRO

By Laurie Ellis

Twin 27 in. (686mm) rotor autogyro completely eliminates torque troubles and enables the model to be trimmed for flight direction. Flies well in all weathers, particularly in strong wind. For 0.5–0.8 cc engines.

U/644 x x

Price C



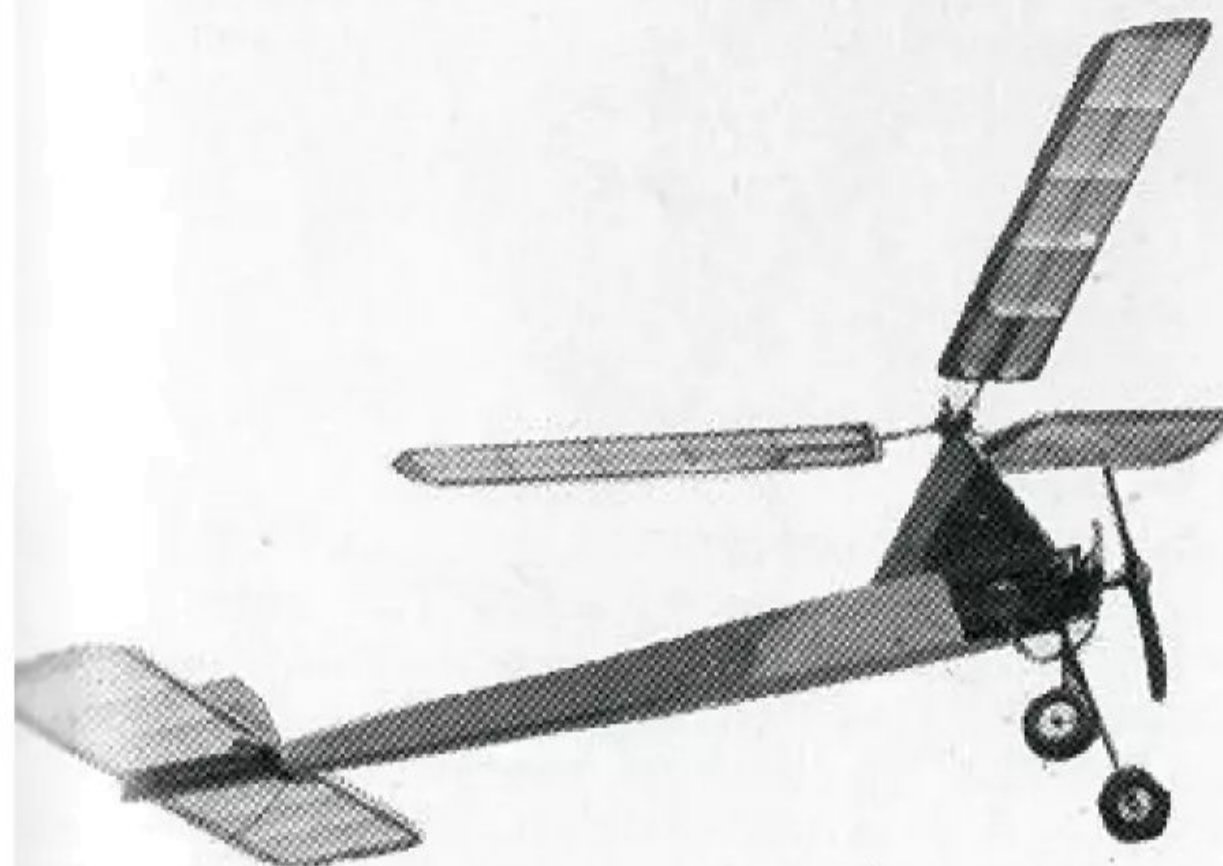
RO-DART

By D. Neale

Simple power driven autogyro for small motors. 23 1/2 in. (597mm) dia rotor. Most amusing and instructive to fly. Quick construction. Use a 0.5 cc engine.

U/456 x

Price C



JUMPING JIMINY

By Ron Moulton

Simple construction, easy to fly, virtually crash-proof. The thrills of autogyro flights are as yet little known; but Jiminy can help to introduce you to this fascinating side of aeromodelling. Maximum rotor size, 30 in. (762mm) dia, for 0.8 cc motors.

U/488 x x

Price C



SKEETER

By D. Cooper and R. Coles

The ideal introduction to autogyro flying. The sixteenth in a line of experiments, success is guaranteed. 32 in. (813mm) dia. rotor. Power with 0.8–1 cc engines.

U/532 x x

Price D

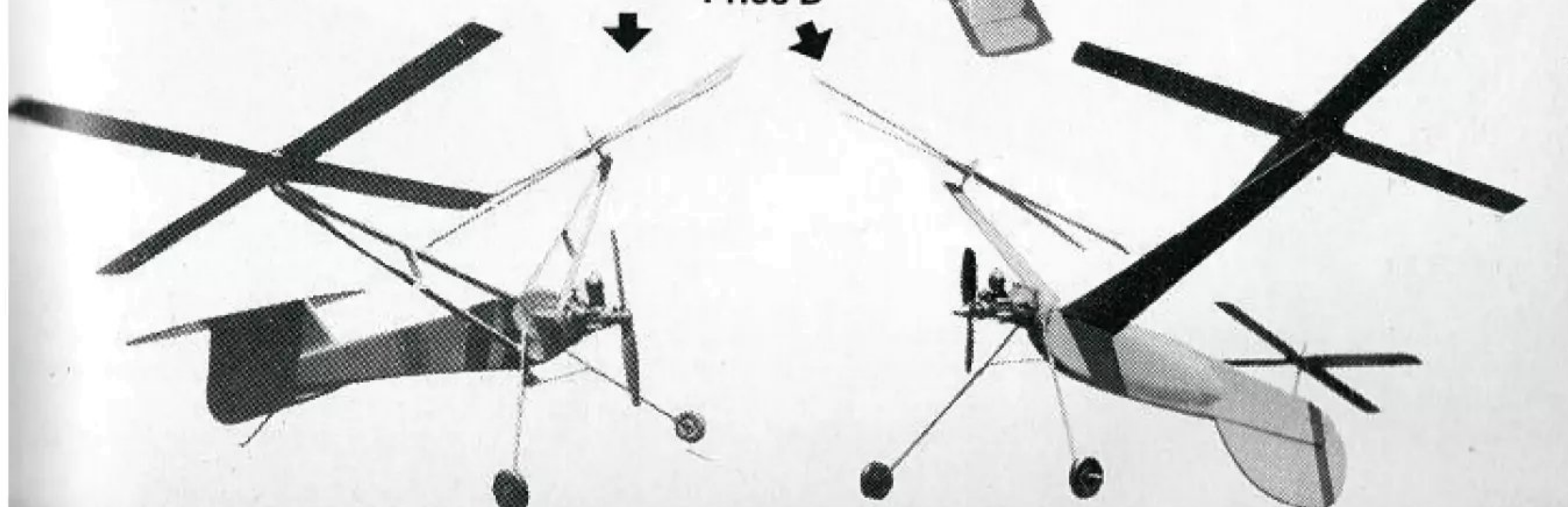
BI-GYRO AND TRI-GYRO

By R. Brown

A pair of free-flight Autogyros with the very stable side-by-side rotor layouts. Bi-Gyro has two 13 1/2 in. (343mm) diameter rotors, while Tri-Gyro has two 12 in. (305mm) and one 8 in. (203mm). Both use 0.02 cu. in. (0.3 cc) motors and feature simple construction.

U/1296 x

Price D





It's a relatively simple model to build, especially the rotors and bearing assembly, with nothing like the complication of a helicopter.

I'm sorry it was 100% my fault, although maybe 50 years is a tad too long to own up and apologise.

It's another one for the build pile but I think this one will be IC powered for a change. I have a good Mk.1 O.S. FS-40 sat in a box. The only mod I would make would be to use the ball race system used on the Rotor Duo (see below) over the plan suggested piano wire and nylon bearing. I have a sneaking suspicion that this autogyro was designed by Bob Brown, not Dave Boddington. DB Models produced the kits and they were distributed by Micro-Mold at the time.

A few years ago, a friend, Carl Shorter and I designed an autogyro for RCM&E called the Rotor Duo. Neither of us had any experience with autogyros but we took our inspiration mainly from the DB Autogyro. With twin contra-rotating rotors (so no torque issues), a tractor electric motor and a simple pod and boom fuselage, nobody was more surprised than us when it flew well without any mods. It was more good luck than design skill, but it worked and we've enjoyed many flights with ours over the years. Hopefully, I will have plenty with the DB Models Autogyro.

DAVE HARDAKER

Dave Hardaker is known to many modellers of a certain age, especially fans of precision aerobatics, as is his very popular Lightning aerobatic model. I seem to remember Flair kitted a version called the Super Lightning. Dave was a member of the UK aerobatics team on a number of occasions and was, I believe, the highest placed UK entrant back in the 1970s.

Sadly Dave passed away this year but although no longer with us he won't be

forgotten, especially by slope soaring fans in Yorkshire.

I first met Dave when I was as a teenager at our school fair. I had a single channel Veron Mini Concord on static display but was under strict instruction not to attempt flying it on the sports field. Dave wandered by, picked up the model and asked if it had flown; it hadn't. In fact, I had never flown power at that point, just a single channel Veron Impala. He persuaded me to fire up the motor (an AM 15), then holding it in his hand and blipping the transmitter to check the radio worked he accidentally launched the model and started guiding it around the playing fields for a few minutes before passing me the transmitter saying, "Here you go, a lovely, easy model to fly."

Knowing I had a seasoned modeller beside me I eagerly took up the mantle and started button pressing, ignoring all warnings from my teacher. The motor cut and just as I was about to land, I heard a familiar screaming in my ear, "GARRITY! WHAT DID I TELL YOU." Dave let me squirm for a few seconds before confessing it was him who had instigated things and placated the raging bull. I learnt a lot about model trimming and flight technique over the years from him. He was a great teacher and always ready to help out.

Back to the slope, a group of us used to fly at Baildon Moor and one evening in 1974 Dave turned up with his pal, Andy Brewster and a pile of plans under his arm. It was for his latest design, the Kwiksilver and he gave them out to anybody who fancied building one. This model was initially intended to have similar aerobatic characteristics to a powered aircraft, but I still remember him saying, "there ain't such a thing and the best attempts are always a compromise."



The British aerobatic team in Doylestown, USA at the 7th World Championships. From the right: Mike Birch, Dave Hardaker, Terry Cooper and Team Manager, Roger Hargreaves. Dave achieved the sixth highest score of the contest.

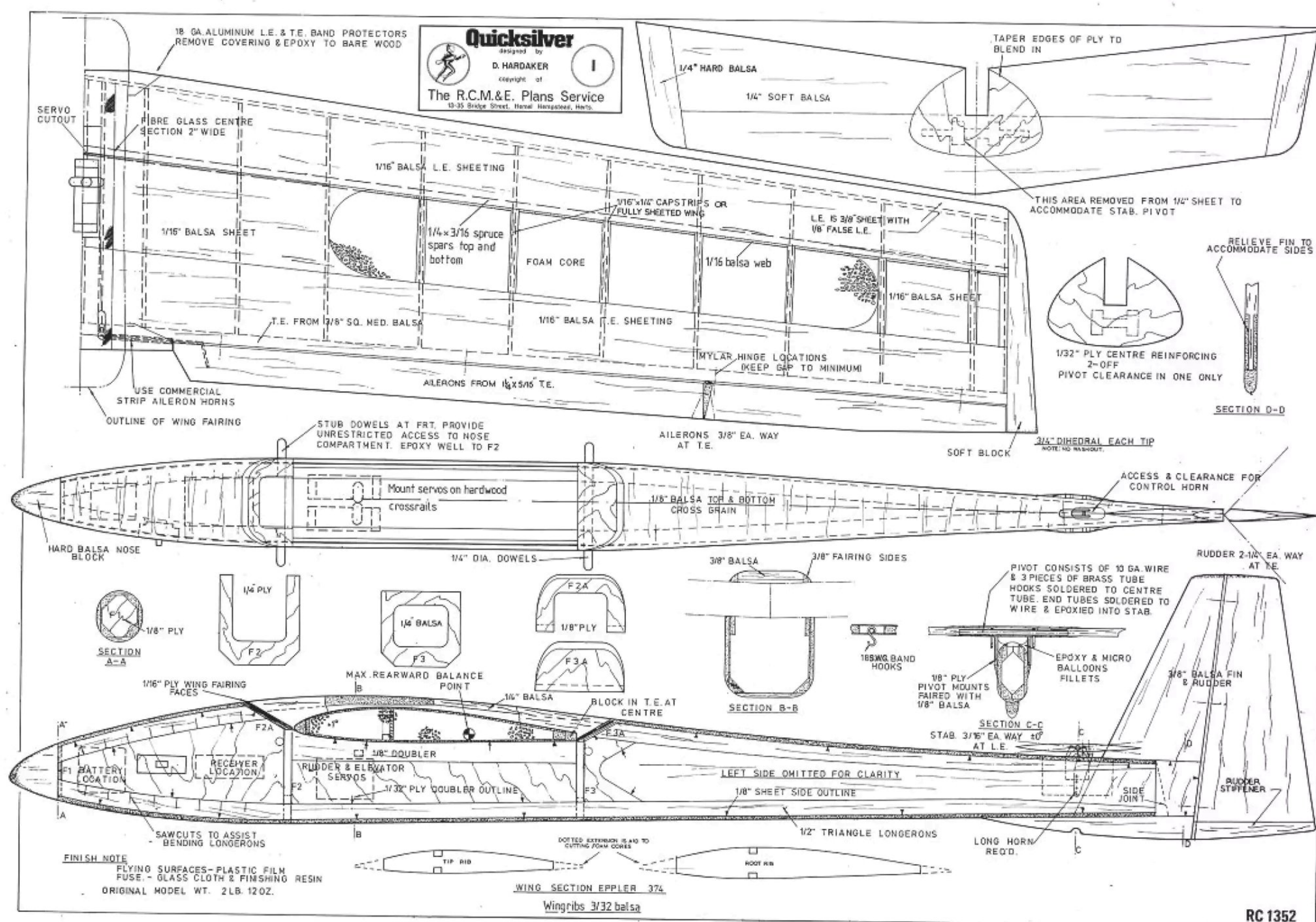


Here's Dave again with the UK team for the 1979 South African World Champs held in Johannesburg. From the right: Ken Binks, Dave Hardaker (standing) and Martin McIntosh (kneeling).

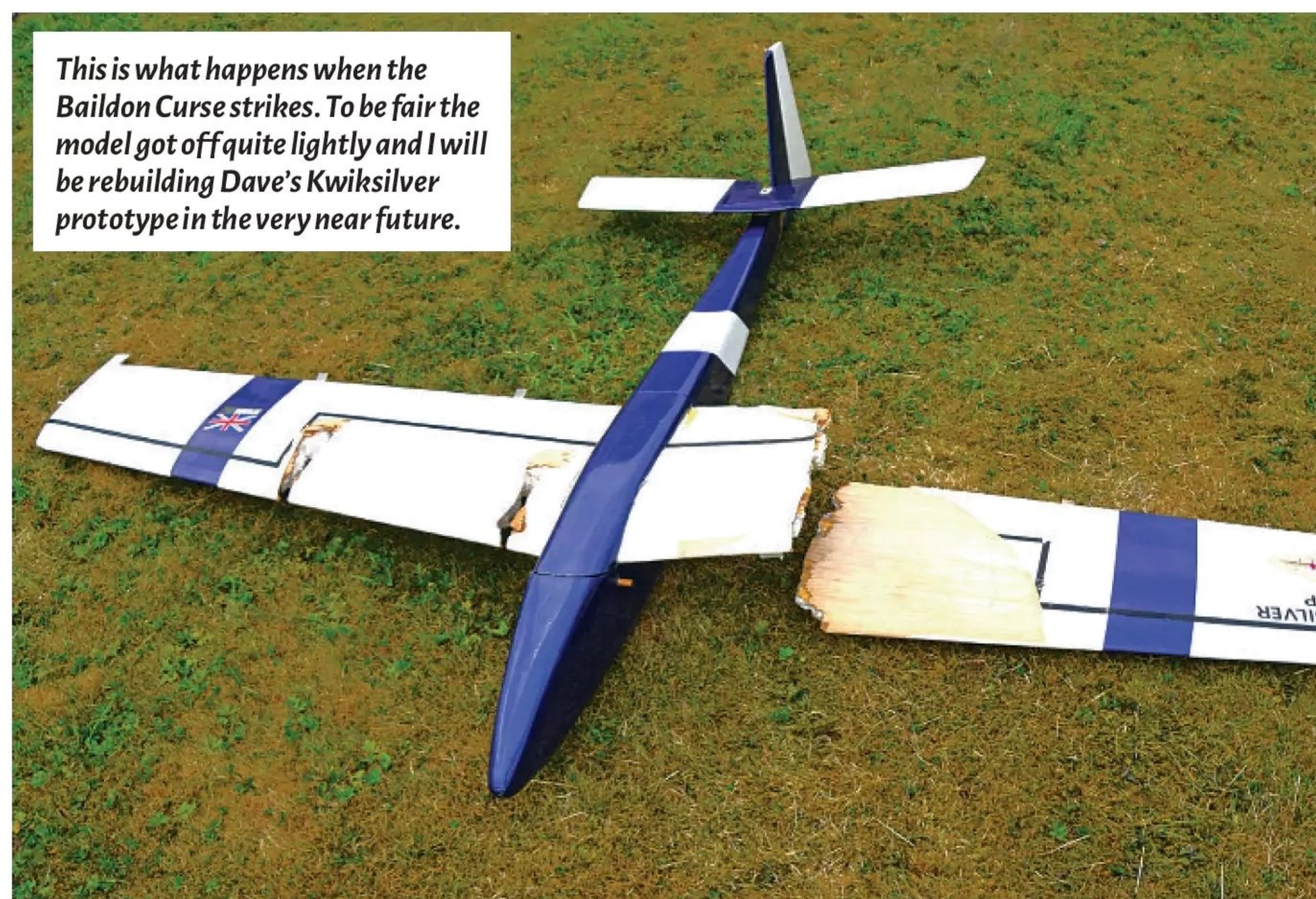


This was my Kwiksilver. I built it for the free plan article back in 2019.

I've been fortunate enough to pick up a couple of Dave's Kwiksvers, one a stunningly glassed example which has all the trademarks of an Andy Brewster finished model. Andy was an absolute master at building and finishing models in glass cloth and Hobby Pox or K&B two-part paints (looking at the model it's hard to believe this isn't fully moulded) and Dave's prototype. Sadly, this model is battered and



Some basic balsa bashing will get your model completed quickly. Build one and see for yourself what a truly excellent model this is.



had obviously succumbed to the Baildon Curse, as you can see in the nearby photo. Lower down the slope there's a set of power lines that run across and over the years many a model has been victim to its merciless electro cheese wires if you got it wrong. It's not the end of the world though as I have a set of ribs and will build a new wing for it and get it back in the

Yorkshire ether once again as the fuselage and tail are still in relatively good condition.

One other thing. You may note my spelling of the Kwiksilver is different to the RCM&E plan (RC1352). When Dave submitted it for publication somebody at RCM&E, in their wisdom, decided to rename it Quicksilver. It always wound him up as they never discussed this with him, so if you have



Dave on the slope with Kwiksilver. Whether a howling gale or a light 10 mph blow, it will perform in most conditions.

one get some new vinyl stickers for it and give it its true moniker. If you don't have one, then build one. You won't regret it.

Well, that's it for another Ramblings. As always please send your stories, questions, photos etc. to me at aeromodeller@gmail.com ■



My personal guideline for a conventional propeller-driven sports aircraft is that if the windspeed is in double figures, stay on the ground!

STALLS & SPINS

Jeff Barringer offers advice on the risks of a model stalling, as well as safe spinning, when flown in windy/gusty conditions

Words: **Jeff Barringer**

Photos: **Jeff Barringer, Barry Atkinson**

I arrived at the field to find Harry looking a little down.

"Hiya, Harry. What's up?"

"Radio failure on my model the other day. I was just turning Finals and suddenly I had no control. Total wreck. Annoying thing though is that the receiver and the connected channels were still working correctly when I recovered the model."

"Ah, so perhaps not radio failure then. What was the weather like? I recall I avoided flying that day as the forecast was for windy/gusty conditions."

"Yes, it was a quite windy and gusty day, but a few other guys were up flying their aerobatic ships and my model seemed to cope well enough."

"And you say the model went out of control as you were turning onto finals?"

"Yes, on downwind the model was going at a cracking rate but as I began the turn back towards the strip, I lost her. Must've been a glitch, I guess."

Well, it's not my job to tell Harry that he

probably suffered from a stall/spin accident, especially while he's more than a little hacked-off about losing his model. But we'll come back to him later.

A SIMPLISTIC LOOK

Let's take a simplistic look at stalls and spins as applied to model aircraft.

First of all, let's consider the aircraft in straight and level cruising flight: maintaining altitude, around half throttle, propeller driven. The forces on the aircraft are thrust, from the propeller, drag induced from the shape of the airframe, lift from the wing and the weight of the aircraft, as shown in Figure 1.

As we're in straight and level flight, let's also for the moment ignore any turning forces caused by ailerons and/or rudder.

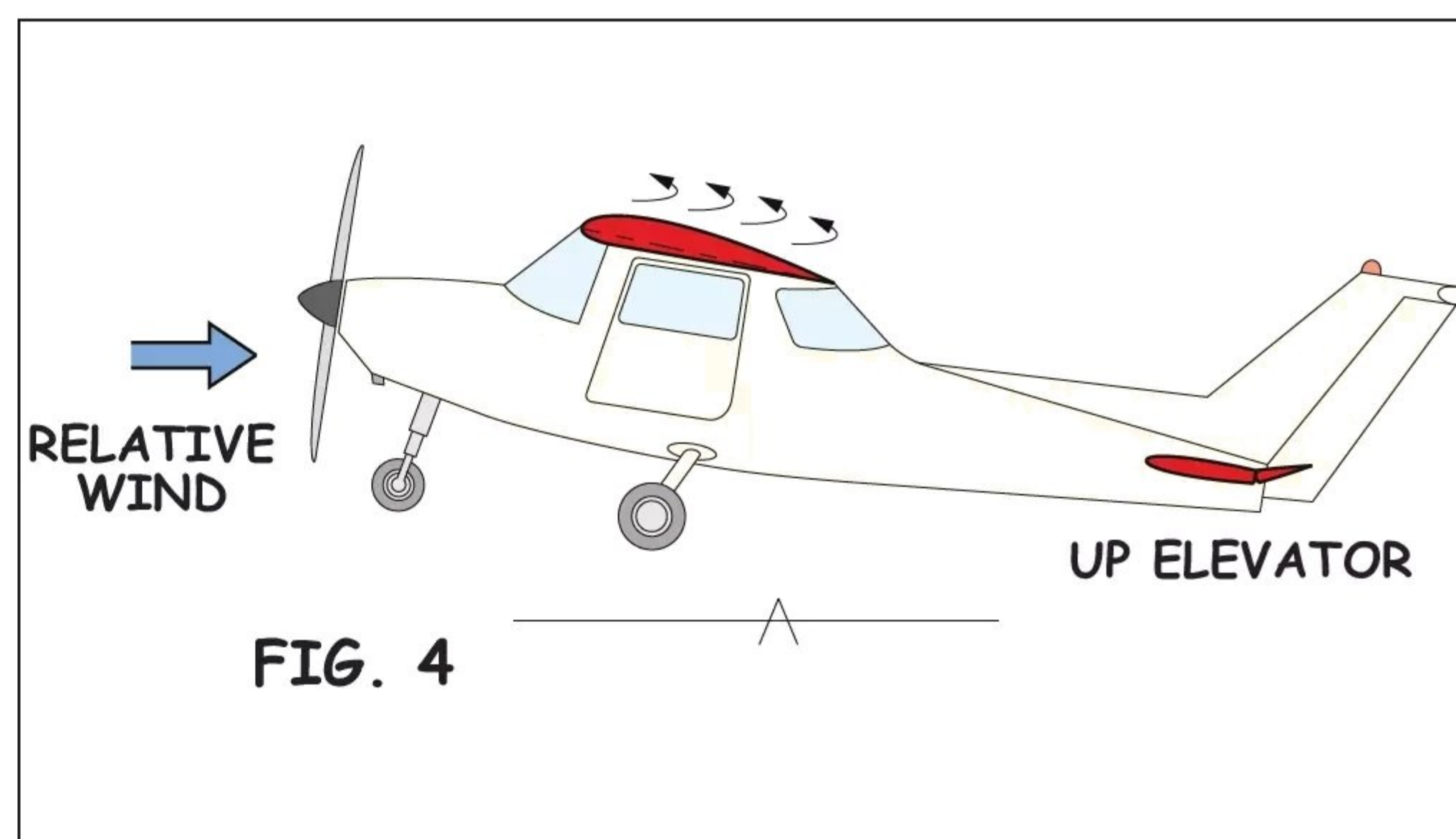
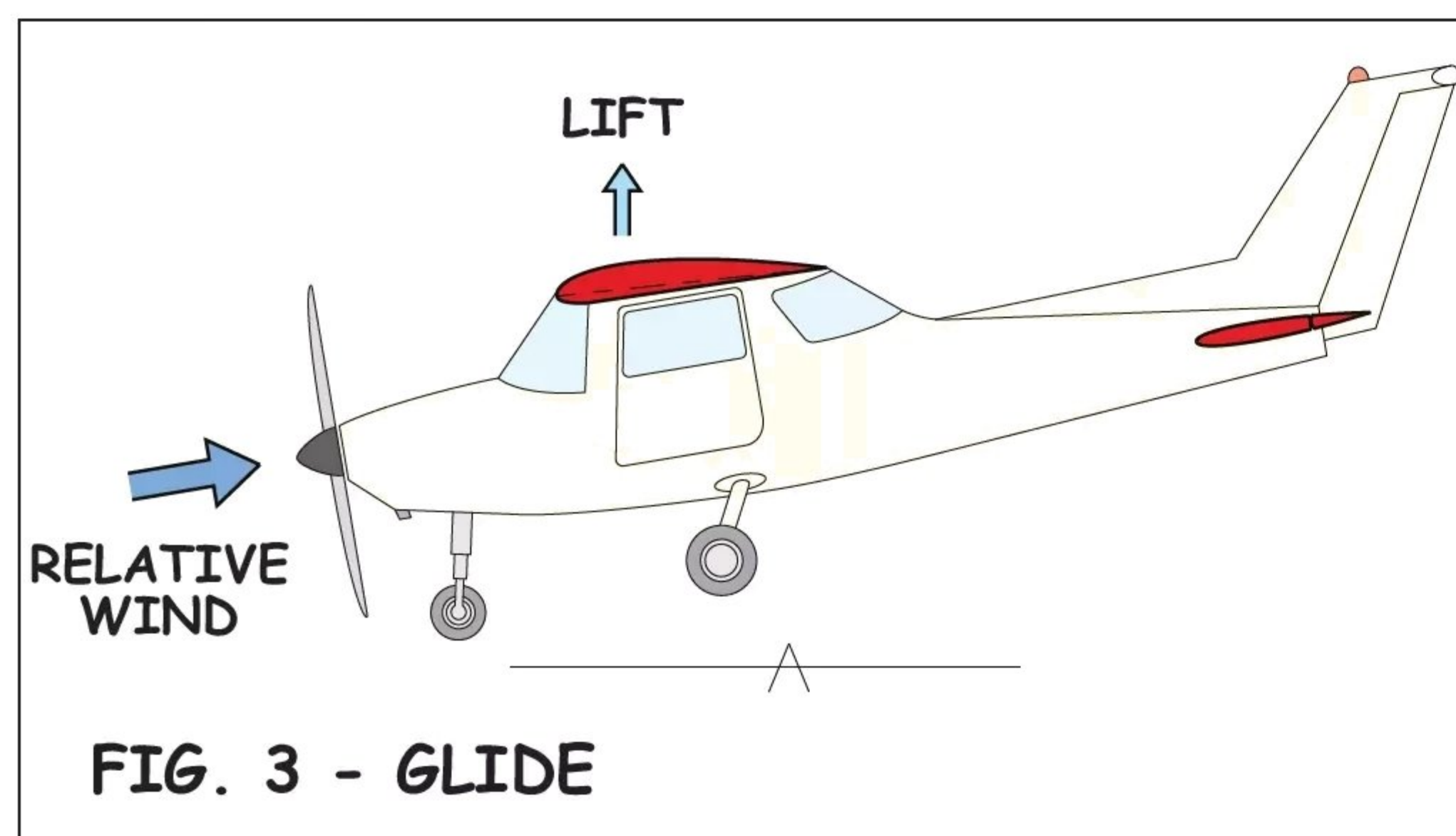
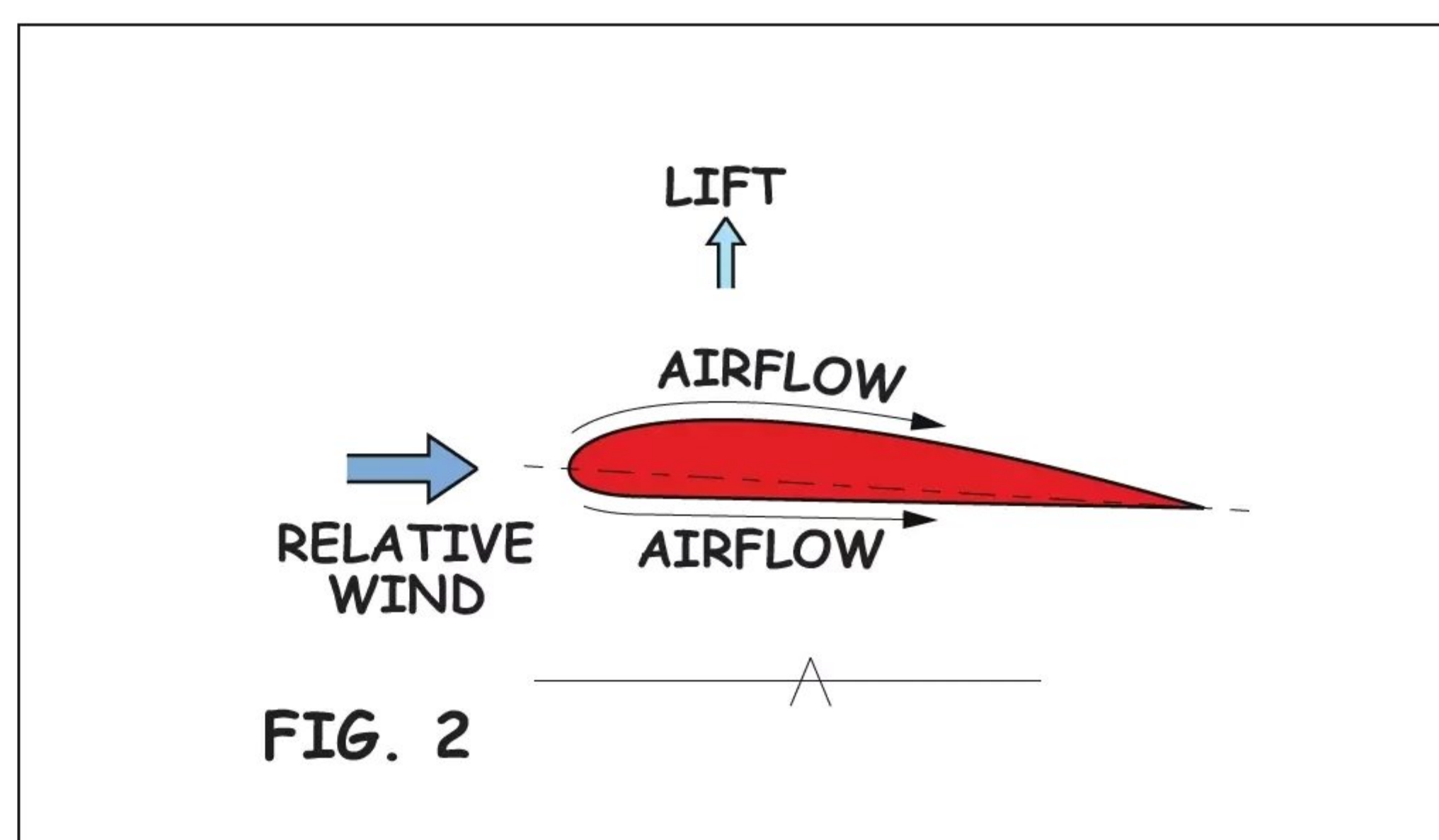
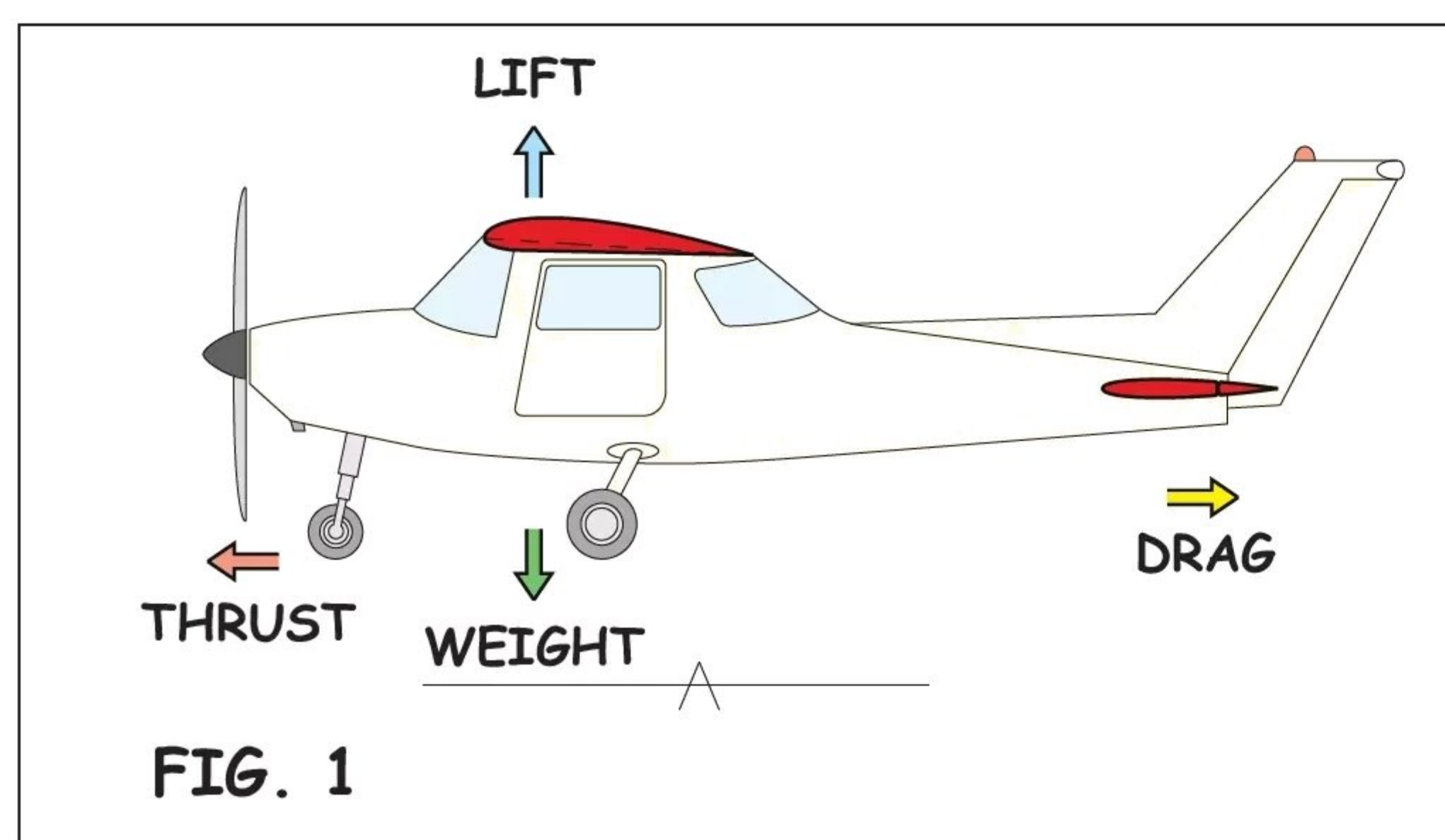
The lift at the mainplane is conventionally thought of as being generated by the shorter

path length for air passing under the wing than for air flowing over the wing, causing a lower pressure at the upper wing surface than beneath. Hence lift is generated, a principle pioneered by Bernoulli. See Figure 2.

The amount of lift will be proportional to the rate of airflow over the mainplane, the mainplane's profile and its angle of attack relative to the relative wind. Working against lift will be the aircraft's weight and the amount of drag.

THE STALL

In simple terms, the term 'stall' is used to indicate that an aerofoil is unable to generate sufficient lift to keep the aircraft in flight and if we look at ways this might happen, we can see that the first and most obvious of these is **reduction in power**. As power is reduced, the airflow over the aerofoil reduces and lift



therefore decreases. On a properly configured model, if it's allowed to, the nose will drop with reduced power to allow the model to maintain flight. Note that I said, 'if it's allowed to'. Sudden loss of power and the tendency of the aircraft to drop its nose can cause inexperienced pilots to pull in up-elevator, with unwanted consequences. Figure 3 shows that, if allowed, the aircraft will fall into a glide.

The second way we might cause a stall is to increase the angle of attack of the aerofoil to the point where the lift being generated breaks down. We can do this by applying a down force on the tail of the aircraft using the so-called elevator ('so called' because it's a really, really bad name for a device which actually controls the angle of attack of the mainplane, and under some conditions can cause the opposite of 'elevate'). Perhaps it should be renamed 'Angle of Attack Control', but for now we're stuck with 'elevator'.

If you look at Figure 4, you will see that the elevator control has been pulled back, causing the angle of attack of the mainplane to increase to the point where the airflow over the upper surface of the wing is unable to remain attached, i.e. the wing has stalled.

There are ways out of this situation: one can increase the power (assuming we are not already at full chat) and/or one can reduce the angle of attack by easing the elevator stick forward. It is important to realise that pushing in forward elevator when the nose has dropped is counter intuitive, which is why you should practice stalls and spins, as below.

WEIGHT

If the aircraft is for some reason too heavy the lift generated may be insufficient to

allow flight. Obviously, this may be caused by simply overloading the aircraft, such as by fitting an oversize battery. Or it could be caused by manoeuvring, thereby increasing wing loading.

BANKED TURNS

We might cause a stall and/or spin when **banking** the aircraft. You will already have learned to apply back elevator when banking a model into a turn in order to maintain height. And while it is quite normal to back off the aileron input once the turn has been established, one will hold in back elevator until the turn is complete. A 60-degree bank will increase the wing loading of the aircraft by 100%, i.e. the effective weight doubles.

CENTRE OF BALANCE

On a conventional airframe the Balance Point is placed ahead of the Centre of Lift in order that the aircraft has a slight nose-down attitude when supported at the Balance Point. The distance forward creates what is known as the Stability Margin and the susceptibility of the model to stalling and spinning will be affected by this; the smaller the Stability Margin the more unstable the model will be. This is usually set and fixed for the particular model but can be altered in flight by a weight shift, for example an unrestrained battery moving.

Finally, the drag on the aircraft will not remain constant but will typically be proportional to the square of the airspeed. Simply put, if airspeed doubles then drag will increase by a factor of four. Also, should covering or trim come loose the drag can be sufficient for loss of control, especially if asymmetric.

PRACTICE STALLING & SPINNING

When I carry out a flight test on a new model, after initial trimming my first action is to check the model for its stall and spin characteristics. It helps greatly to assess the overall characteristics of the mode but, more importantly, it gives me an idea of how the aircraft will land should I find myself forced to make an immediate landing for some reason. I believe that everyone should practice stalling their aircraft, not only to learn about its characteristics, but also to increase their own confidence in handling the machine in unusual situations.

At a comfortable height, run the aircraft into wind, reduce power and ease in back elevator. On a relatively benign trainer type aircraft the lack of lift in the stall will cause the nose of the aircraft to drop, airspeed will increase, lift will be generated and the model will resume flying. Continuing to hold back elevator will cause the process to be repeated and the model will display a series of stalls and recoveries, known as a phugoid. Simply fly out by removing the backpressure from the elevator and restoring power.

On a less than benign model the stall will cause the nose of the aircraft to drop more dramatically. But if this results in insufficient airspeed gain due to over application of back elevator, height loss will also be dramatic. Note that if you stall with the model facing downwind on a windy day the apparent angle of attack at the stall will be less steep than that for into wind. Recovery again is to ease the backpressure from the elevator and increase throttle to fly out of the stall.

If you're at all nervous about deliberately stalling your aircraft, ask an instructor or experienced pilot to demonstrate.

A classic wing drop on take-off. It caught the photographer by surprise too!



SPINS

A perfect model will stall wings level and lose height rapidly in a nose down attitude. Unfortunately, few models are perfect and any difference in the lift characteristics of the two sides of the wing will result in the model dropping the wing, with the lower lifting ahead of the other and the model possibly entering a spin. Again, there are design techniques to remove or reduce this tendency, such as building washout into wings so that the inner surface of the wing stalls first, and/or creating aileron differential to reduce the drag moment caused by the down going aileron.

Recovery again is to ease in forward elevator and increase throttle to fly out of the situation. Some advocate applying against-spin rudder but while you are trying to figure out which way to push the rudder you could well hit the ground. So, for the time being, forward elevator and power will get you out of trouble.

TIP STALLS

We talked about a high angle of bank causing an increase in wing-loading, and as part of my personal test-flight regime I always fly really tight banked turns in both directions, gradually reducing power and therefore airspeed to try to induce the model to flick out of the turn. This is known as a tip stall and provided there is sufficient height it is easily recovered by easing off the back pressure on the elevator, increasing power and levelling the wings.

'Okay', I hear you say. 'But what has all this got to do with flying in windy and gusty conditions?'

WINDY & GUSTY CONDITIONS

On windy, gusty days our aircraft, when in the air, are subject to all manner of variations in conditions. In addition to its speed and

gustiness, the wind's interaction with the ground leads to windshear, turbulence, directional shifts, dead zones, curl over, all of which can be quite random and difficult to predict. All of these issues can make your perception of the model's performance difficult to assess. A model which normally flies at say 30 miles per hour and stalls at say 15 miles per hour will be facing a real challenge in a 20 miles per hour gust. The jet guys have a much greater airspeed to windspeed ratio on such days which is why they can tolerate windier/gustier conditions.

If we are concerned with stalls and spins, we've already learned that airspeed and elevator input are key ingredients to things going wrong. So, if we are to avoid grief, we must be aware of the dangers and take extra precautions.

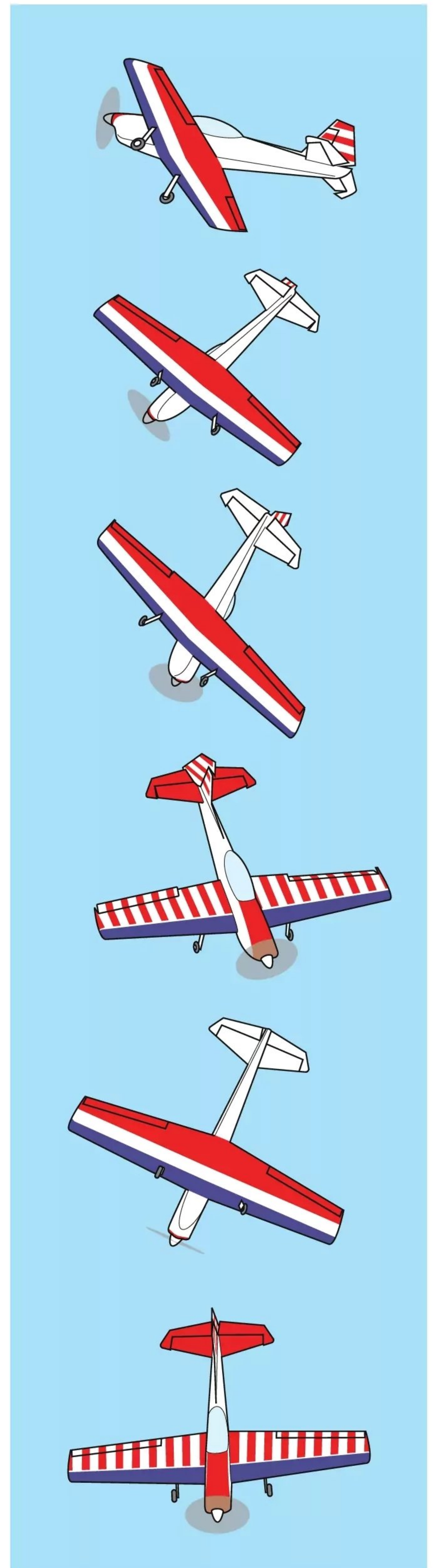
We've heard that Harry suffered his 'glitch' when attempting to land, so let's take a look at the **Circuit**.

The circuit is used to prepare the aircraft for landing, by reducing height, slowing down, dropping gear and flaps if fitted and generally completing those downwind checks. Unfortunately, this can be the time when the model is most at risk.

You've learned to fly the downwind leg at cruise power, having slackened off speed after aerobatics and general manoeuvring. Once steady, down go the flaps and gear if fitted and you're ready to turn onto base leg before setting up for reduced power and finals.

PERCEIVED VERSUS ACTUAL

The biggest problem is judging your speed downwind because on a very windy day it will be covering ground at an unaccustomed rate but yet its actual airspeed can actually be low, being blown along past you by the wind. Your



natural (and trained) reaction is to slow the model ready for the base leg and finals.

Harry's words were, "Yes, on downwind the model was going at a cracking rate but as I began the turn back towards the strip, I lost her. Must've been a glitch, I guess."

Jets have a greater airspeed to windspeed ratio which is why they can tolerate windier/gustier conditions.



This kind of climb out is far too steep for a gusty day.



So, let's try to analyse what may have happened. First of all, the model was going at a 'cracking rate', so Harry's natural reaction would be to reduce throttle to slow her down. Further, with the model disappearing downwind at such a rate he would be tempted to bank the aircraft sharply and steeply in order to bring her back around onto Base/Finals. So now we have an interesting combination of conditions: low airspeed, highly banked and back elevator. The perfect storm. All it needs at this point is a gust and I think it's likely that at that point the aircraft cried 'Enough!' and entered a stall/spin. Harry would have seen the nose drop and instead of easing off the back pressure on the elevator, increasing throttle and levelling the wings, he **increased** back pressure on the elevator and watched her crash.

So, what could Harry do about it? Well, honestly not much at that time.

The problem is that such crashes happen when the aircraft stalls at 50 to 100 feet, meaning that the time interval between the stall and the bin bag is just a few seconds. To effect a recovery, you first of all have to recognise the fact that the model is stalling and then take appropriate action - ease off back elevator and increase power. If we consider that it will take way less than five seconds for a model in a turn-in spin to hit the deck, we will have to be a pretty good model pilot to recognise and recover from such an unexpected occurrence.



Beware of a sudden side gust when close to the ground.



OTHER DANGERS

It isn't just in the circuit that windy/gusty conditions can cause us to lose our models. Fundamentally, any time we have insufficient airspeed, too much angle of attack, an overweight condition and/or insufficient power we can lose control:

Take-off

In gusty conditions, wind direction can change in a very short space of time, for example between glancing at the windsock and starting the take-off run. The model will climb at an unaccustomed rate and turbulence can easily cause wing drop, so keep the power up and don't climb too steeply.

Aerobatics

I once lost a rather nice aerobatic biplane when flying in very windy conditions. It was a club Open Day and the wind was around 17 knots. Surprise, surprise, no one else was flying but I decided I'd put on a display. All went well until I flew the model directly into wind and climbed vertically into a stall turn (the clue is in the word stall). She went over well enough and descended vertically but unfortunately at that point the conditions decided to change and the back elevator necessary to pull out at the bottom had no bite. So, she went into bin bag mode. Hindsight is a wonderful thing and in retrospect I should have energised the elevator with a burst of power. But, hey, I'd flown the manoeuvre a hundred times before without a problem.

In gusty conditions a model can be blown over when taxiing.



Landing

The conditions experienced on a windy/gusty day can play havoc with your landings. Turbulence near the ground can provide you with a sudden windshear, side gust or updraft and can also cause your model to over-bank

when a correction is applied or when turning finals. Your model can be blown off-line on approach and a strong wind can make you wonder whether the model will ever reach the patch. Airspeed is particularly hard to judge with the aircraft coming towards you.



Sad result of a stall/spin in windy conditions.

Taxiing

Having reached the ground, it is far better to walk out to retrieve the aircraft than to attempt to taxi it. Many taildraggers won't turn on the ground against a strong crosswind and even tricycle models can be blown over. Far better to walk.

RECOMMENDATIONS

We've left old Harry alone to lick his wounds for a while so perhaps we could take the time now to consider his options with the following recommendations in windy conditions.

The obvious one is to stay on the ground. My personal guideline for a conventional propeller-driven sports aircraft is that if the windspeed is in double figures, stay on the ground. So far this year in the UK has seen many days out of limits, so if you must fly, then consider the following...

- Keep the throttle above half stick for the entire flight until the turn onto finals is completed. We saw above that relative airspeed is difficult to perceive so even though that downwind leg appears incredibly quick, it probably isn't in airspeed terms. Remember, an aircraft flies on airspeed, not groundspeed.
- Fly a higher and tighter than usual circuit and landing, which will give you the opportunity to recognise and counter any problems. With a strong headwind your model will descend at a steeper angle than usual on finals, but that's fine because excess airspeed gives you some immunity from gusts. Keep some power on until you're certain of a landing.
- Practice stalls and spins at a safe height with different aircraft configurations and do it regularly. Practice tight turns left and right at varying power settings to try to induce tip stalls. If you're expecting them, you can recover the situation.

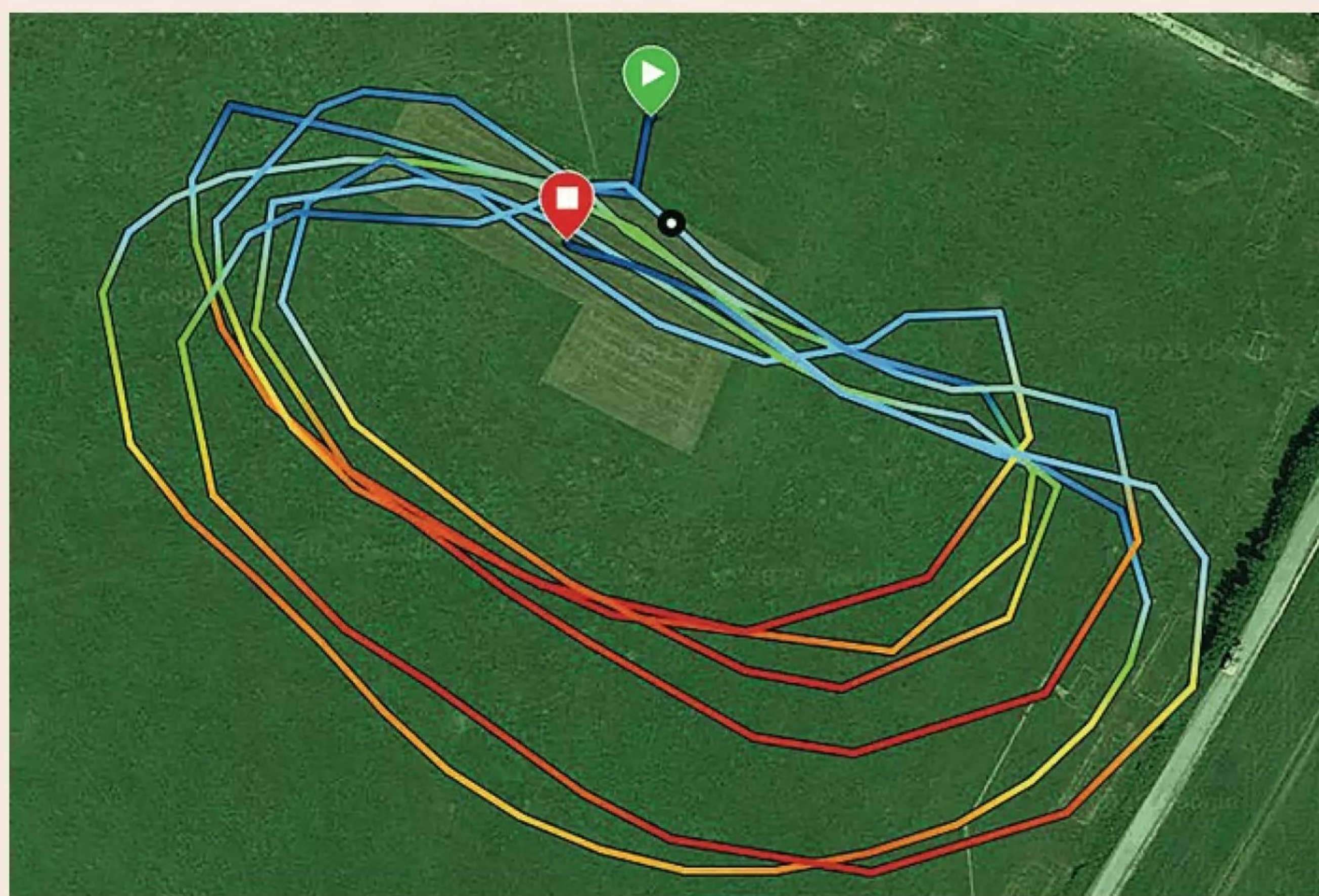
GPS TRACKING

By way of an illustration of the dangers of flying in windy/gusty conditions this picture is from a track of circuits flown with a cycling GPS attached to a trainer aircraft.

The picture shows the groundspeed around the circuit flown with constant throttle and constant height, the red lines representing the downwind groundspeed (up to 50 mph) and the green the into-wind speed (around 22 mph). Also of note is that the speed often drops back to around 19 mph in turns.

Now, while the airspeed of the aircraft is pretty much constant, the apparent speed of the aircraft to a stationary observer is that it is going very quickly indeed on the downwind leg and this makes it very tempting indeed to close the throttle before making the turn onto finals. My case rests.

With thanks to clubmate John de Quincey for his help.



- If the model appears unexpectedly to go out of control, immediately release back stick and, if appropriate, apply more power. You really won't have time to think about this, so your response has to be ingrained.
- Stay on the ground. There'll be no real fun and nothing learned if the aircraft is being blown all over the sky. Sit back and watch the jet guys. ■



FUN FLYING WITH A COMBAT WING

David Ashby checks in after a busy winter slope season with his Tomahawk foam wing and successfully flies a mini AT-6... with a Futaba Tx

Words & Photos: **David Ashby**

In some slope soaring circles it's a very dirty word and I know I shouldn't use the C-word but perhaps you'll forgive me just this once...

That word is of course 'combat'. For years I resisted the urge to slap a few chunks of foam together, preferring instead to come over all high minded and virtuous when everyone else was trying to knock each other out of the sky. Eventually I relented, splashed sixty quid on an MT Foamies Wildfire wing and can honestly say that no other model has provided more fun.

Wings tend to come out more over the winter months when it's too chilly, grey, damp

and muddy for the nicer soarers. Several new flyers have joined the fun this year, with Hacker's 1.2 metre span Tomahawk NG proving popular. My old Wildfire was looking a bit tatty so I bought one too.

TOMAHAWK NG

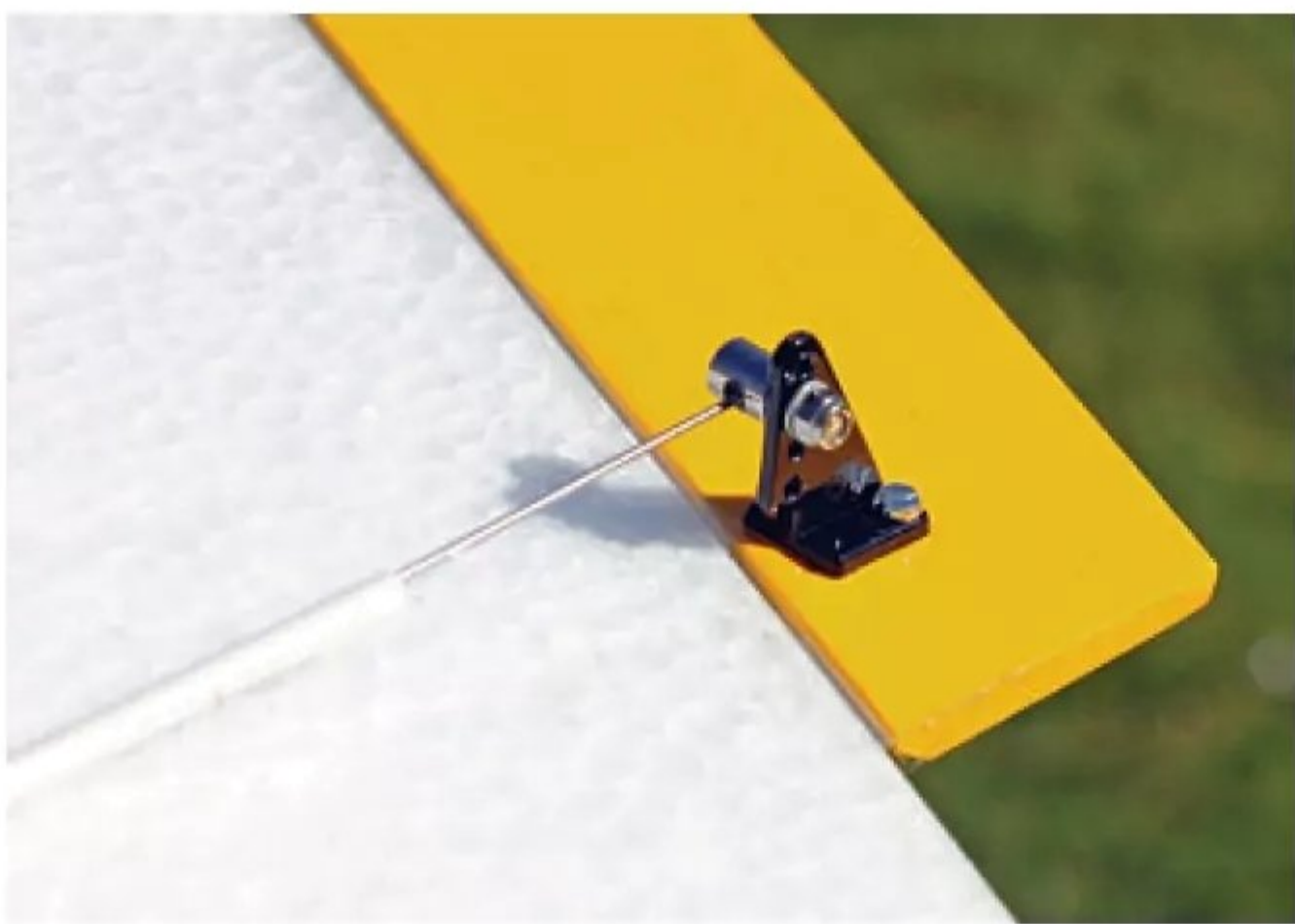
Two hobby businesses use the Hacker name, but this is from Hacker-Model in the Czech Republic and, as far as I can see, is available only from Model Shop Leeds in the UK. Two versions are produced, Basic and Advanced, although the Advanced version's pre-cut servo apertures are the only difference between them.

The design uses EPP foam wing halves, Correx wingtip fins and pre-shaped balsa elevons. Apart from radio gear and adhesives everything required is in the box, including a roll of lightweight iron-on covering film. Two 15 - 20 g metal gear servos are suggested, along with a four or five-cell flat NiMH battery in the 1600 - 2000 mAh range.

There's little to do so it goes together easily, guided by good instructions drafted in Hacker's usual photo step stage style. I joined the two wing halves using epoxy rather than the cyano suggested and was surprised by the absence of a beefy wing joiner apart from a thin strip



If you can't beat 'em...



Keep an eye on the exposed elevon linkages...



...or add some form of protection like this.

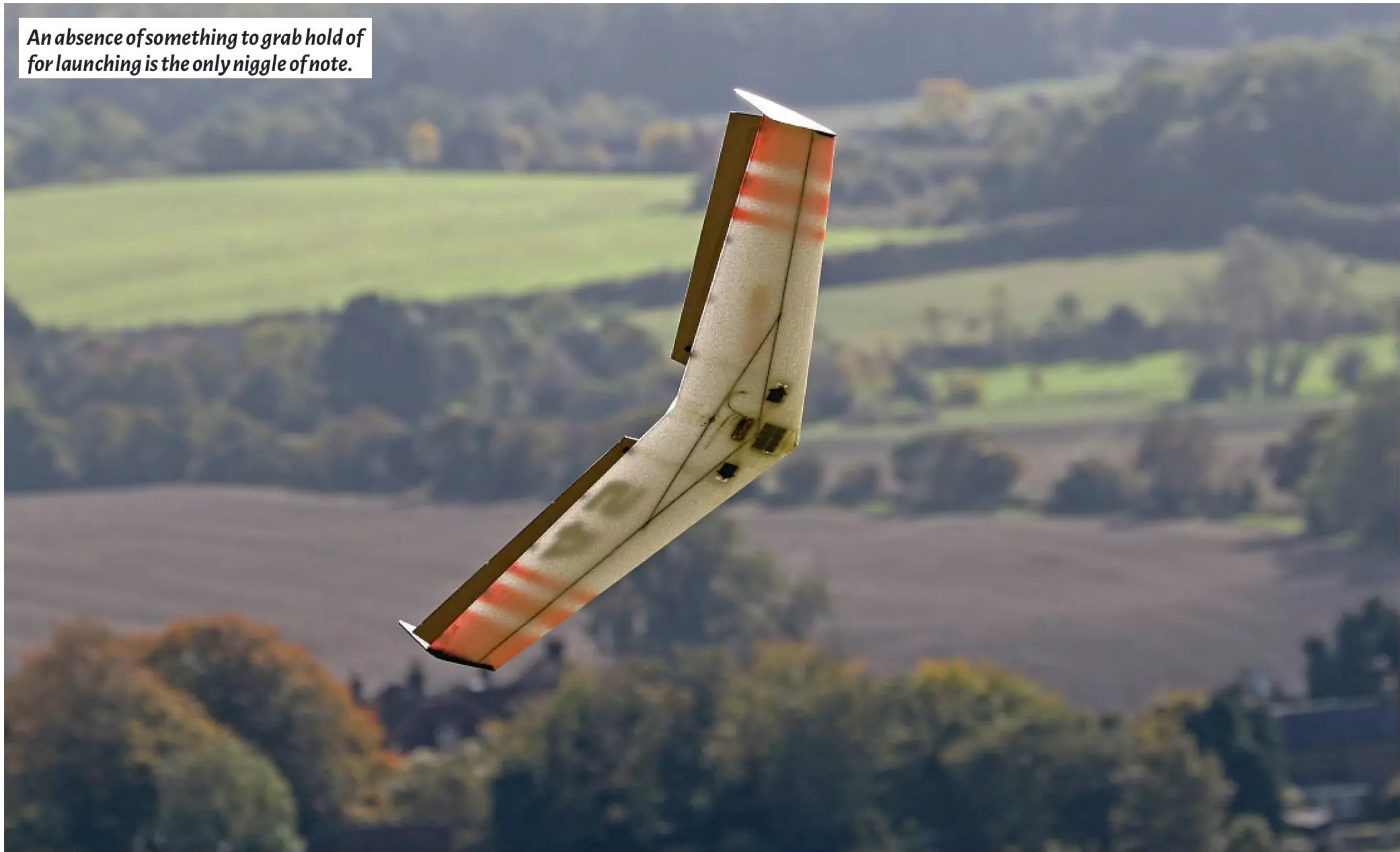
Clear covering film supplied adds rigidity to the Tomahawk so don't be tempted to use tape out of habit.



Flying buddy Richard 'retrieves'.

of carbon on the top surface. It's nothing to worry about; at the last count we had eight Tomahawks flying at the local slope, all without a problem. So don't overthink this stage if you get one.
The secret to a good combat wing is getting all the critical bits, like servos and pushrods hidden and out of harm's way. Hacker has just about managed that here although the servo horns and pushrod ends are exposed. One flyer has replaced his piano wire pushrods with 

An absence of something to grab hold of for launching is the only niggle of note.



“Foamy wings like this make an ideal slope trainer for the obvious reason that they’ll take plenty of punishment”

Bowden cables sunk nearly all the way to the horns, then shielded what’s left exposed.

Hacker suggests painting a scheme before covering the wing with the clear film supplied. The result looks far better than acres of tape, although old habits die hard. Surely all wings need taping, don’t they? Well, no they don’t; it’s surprising how much rigidity the covering adds, although I did succumb to habit by adding some glass tape to the nose and leading edge.

Launching is trickier than some wings owing to an absence of anything to get hold of on the underside. But holding it at the leading edge usually works. My first flight demonstrated that I’d fitted the battery too far back. The rolls were horrible, so it flew better after I’d added 30 g at the nose. That brought the all-up weight to 500 g, a tad more than the 430 g Hacker say to expect but still comparatively light.

It’s quite nice when everyone steers the same wing around but combat or not, it’s a pleasant

You can thank Andy Mollett for continuing Zagi production in the UK.



model to fly, agile and forgiving when trimmed. Foamy wings like this make an ideal slope trainer for the obvious reason that they’ll take plenty of punishment and come back for more. They’re perfect too when the landing area is small or an unknown quantity so it’s little surprise that most hill flyers have one in the hangar.

ZAGI’S BACK

Talking of wings. Yep, it’s back and Andy Mollett is the chap you can thank. First introduced over 25 years ago in the USA, it was Ali Newman and Alan Munns who brought an example home, re-designed it and put it into production. Dave Warren

My Phase 6 scoots along the north Kent coast in April.



My Phase 6 moment took a while coming.



“All it took was a modest north Kent coastal site and a smooth NE wind”

took over but decided to stop just before the pandemic.

Says Andy, “For some reason I took on manufacturing in 2020. This meant shoehorning new aluminium billets, a new laser machine and the old vacuum machine (that Dave used to make pods for the electric version) into my shed!”

Along the way he’s incorporated a modest redesign. If you’ve built one before then you’ll know that an EPO foam leading edge was stuck on during assembly but the wing is now a one-piece item made using EPS foam. Everything needed is in the kit bar radio gear, electrics and glue.

He’s now producing the kits and selling them at flyingmoleman.co.uk so take a look. I asked about the trading name and Andy explained that it became his nickname when he raced 1/8-scale cars at National level, his car sometimes spending more time in the air than on the road!

PHASE 6

I’ve been a committed slope soarer for the last 13 years now but, until recently, I hadn’t owned or flown a Chris Foss Phase 6. I’m not sure

*Smooth coastal soaring.
There’s nothing quite like it.*



why, although if I’m being brutally honest it’s probably because those I have seen flown, nice though they look, hadn’t really awoken a desire to own one.

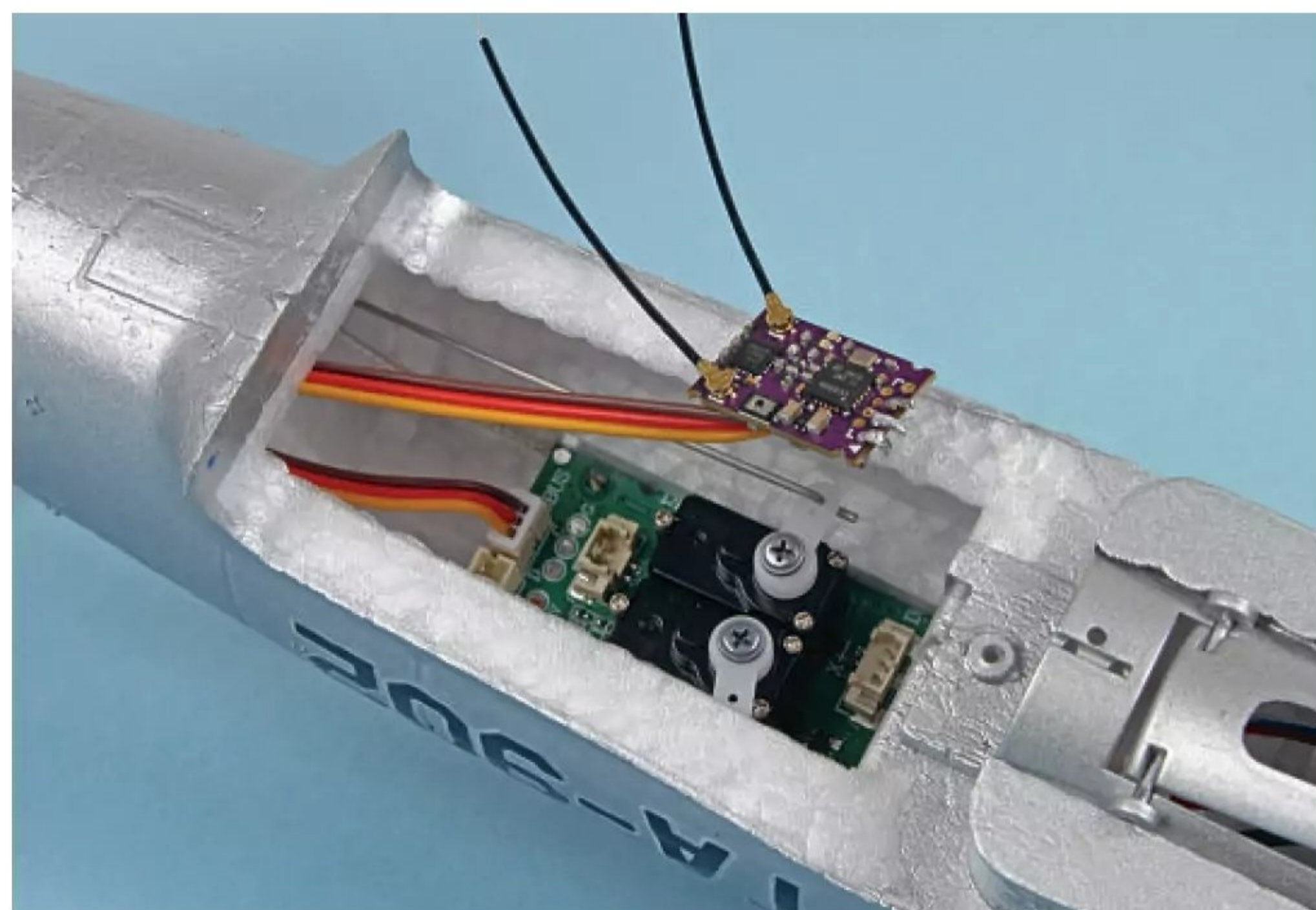
Until a couple of years back that is, when the contents of a late clubmate’s shed came up for sale, a mixture of power models and gliders, among which was a nicely done but part-built ‘6’. That came home with me and sat in the workshop for a year when a friend, Barry Apostolou, began looking for one. It went home

with him and, excellent builder that he is, he glassed, finished and flew it. I saw the result and asked for first dibs if he decided to part with it, which he eventually did. And it’s lovely. No really.

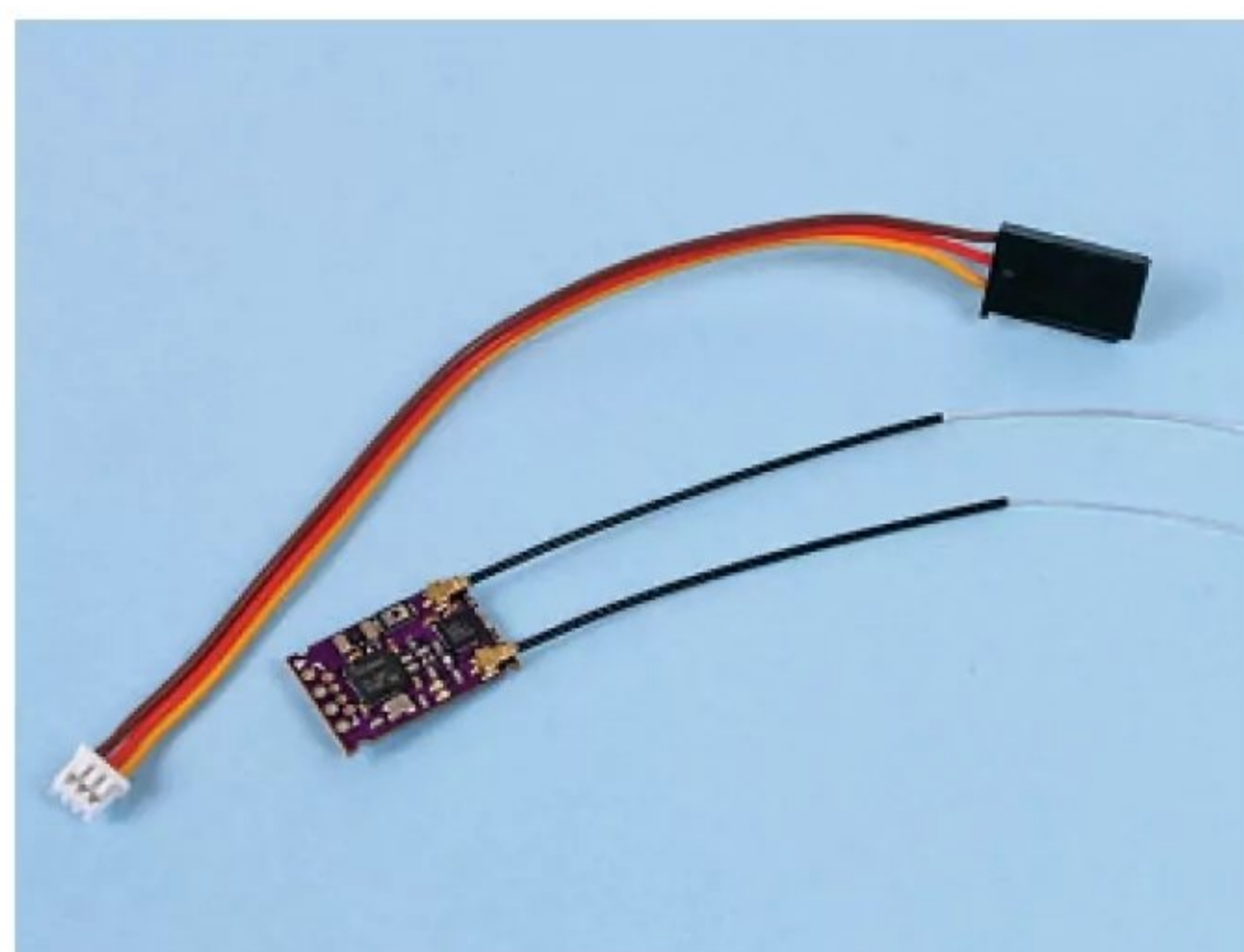
There came a day when we really bonded. All it took was a modest north Kent coastal site and a smooth NE wind. I could’ve flown it all day. There are times when blasting a moulded something around seems just right, yet there are also days when steering a



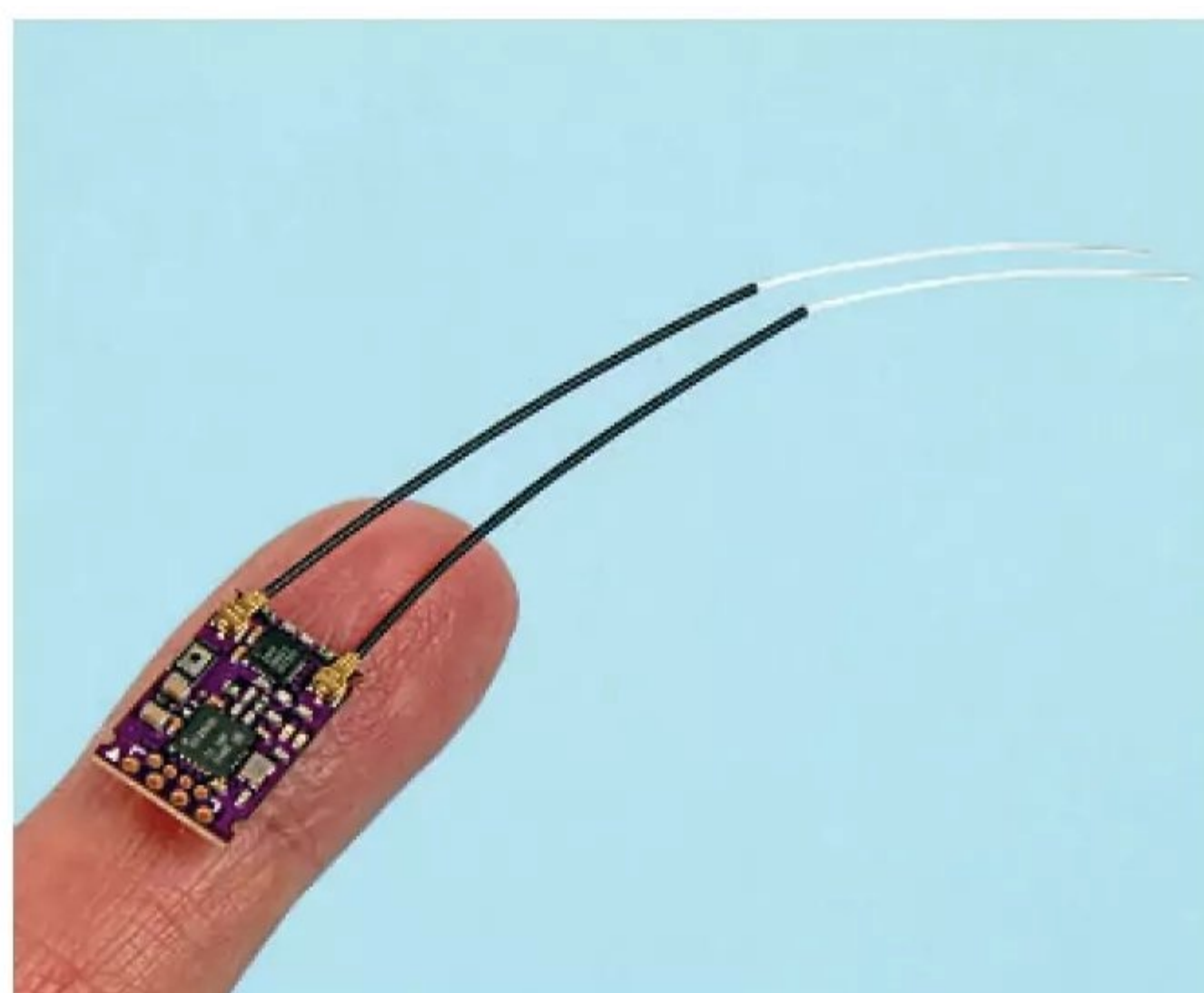
Bundled transmitters just about do the job but they're no substitute for a mainstream brand example.



There's plenty of room for it. Please don't examine my soldering too closely.



A lead is supplied to help those wanting to go down the SBus route although in my case the black plug was removed and the lead soldered direct to the receiver.



My aftermarket Futaba S-FHSS compatible receiver. That little black dot is the bind button.

classic soarer through relaxed aerobatics really hits the spot. Or perhaps I'm just getting older. Anyway, it's good to be finally acquainted.

CONVERSION JOB

Those little transmitters you find bundled with mini ready-to-fly (RTF) models are fine up to a point. They do the job, I suppose, and manage

to steer these ultra-micros around. But they're no substitute for even the cheapest transmitter offerings from mainstream brands like Futaba or Spektrum. I've relied on the Tx included to fly my Top RC mini AT-6 but when inputting some rudder one day, I noticed the stick didn't spring back to centre afterwards. It just stopped where I'd put it, so something had to be done.

The manual mentioned that the 2.4GHz protocol used is compatible with OpenTX. I'm a Futaba person so that was no good. But further on there's reference to two ports on the main ESC/Rx/Gyro board designed for Spektrum satellites and S-Bus receivers. I gave the folks at J. Perkins (the UK distributor) a call, spoke to Steve and asked whether anyone had flown the model with a Futaba S-Bus receiver. "Yes, me!", he said. He told me what to do, I've done it too and it works very well. So, here's what you need to know...

First up it's important to note that the model's electronics only co-operate with Futaba's

Much better.



S-FHSS and FASSTest protocols, not T-FHSS or FASST. I had to find a receiver to install. Futaba's offerings come in a little heavy at around the 5 g mark, so I cast around for a lighter aftermarket item. Incidentally, I'm not talking about a receiver in the traditional sense with a row of servo sockets protected by a plastic case. Rather, a small board with a single output, much like multirotors use. In this case something to bypass the model's built-in receiver while allowing the existing ESC/Gyro/servos to continue doing their thing. A bit of Googling found me the ridiculously tiny XR602T-S, an eight channel S-FHSS protocol board weighing just one gram. It cost £16 and took a couple of weeks to arrive direct from China.

Soldering came next. The board is too small to accommodate a plug socket so the servo plug on the spare lead that came with the model must be removed and the wires soldered to the board. A small instruction card shows where to connect them and, if your eyesight is like mine, you'll need an illuminated magnifier over the work while solder is carefully applied.

There's plenty of room for the Rx in the fuselage and after connecting the Rx and powering up, the receiver's tiny bind button soon had the AT-6 talking to my Futaba T6K transmitter.

So far, so good. The flight modes seemed to have defaulted to one of the Tx's three-position switches, although the difference between Beginner and Intermediate Mode was difficult to gauge. Expert mode was obvious thanks to increased deflections and this was the mode Steve said he preferred, albeit with aileron travel reduced to 70% at the Tx while adding 45% expo.

With that all dialled in the first flight on a cold but calm winter day went very well. It's obvious that the stabilisation system is helping out more in Expert Mode than it does using the supplied transmitter. I can't explain why that is but it's not intrusive. I can't tell the difference between Beginner and Intermediate Modes though. Both seem restrictive, although I only use them to keep the wings level for take-off and landing.

Other than that, it's just nicer flying the model with a good quality transmitter. The AT-6 seems to track better and smoother, while rolls and loops aren't reliant on a process prompted by an 'aerobatics' button. If you're a beginner, then I'd suggest sticking with the Tx supplied but anyone else will find the exercise worth the effort.

LIFELONG FLYER

We lost our dad, Maurice Ashby, in March. He passed away at the good ol' age of 92. A lifelong aeromodeller, he'll be known to some readers from his published designs starting with Wee Wun, a tiny control line model in 1968, the single-channel Sleeker in the same year, Cardsharp (2000), a Lacey M.10 (2003) and a few others. He had a particular love for delta wings too, creating many own-design sportsters using balsa, cardboard and foam. Apart from turbines there was hardly a model flying genre he hadn't touched, something that's probably rubbed off



Dad, in about 1960 with his control line DC-3. He sold it to buy his first set of single-channel gear, as you often had to in those days.



Maurice Ashby with his Dep-Stik design, published in RCM&E, September 2015.

on me judging by the eclectic mixture of flying machines in my workshop.

Dad's shed was a source of wonder when Graham and I were young. A wonderful smell pervaded thanks to those IC engines and doped airframes. An old kitchen cupboard held the real gems though, including, along with plenty of other curios, the glues, paints and thinners our Airfix projects hungrily devoured. Trouble was, he kept it locked.

Then, one day, I noticed that the key to Mum's sewing machine cover looked very similar to the one that opened that cupboard. Creeping stealthily into the shed and trying the key in the lock felt like a scene from an Indiana Jones film. With a click, we were in. Although our strategy was always to tread lightly, I think Dad swiftly cottoned on to our activities but

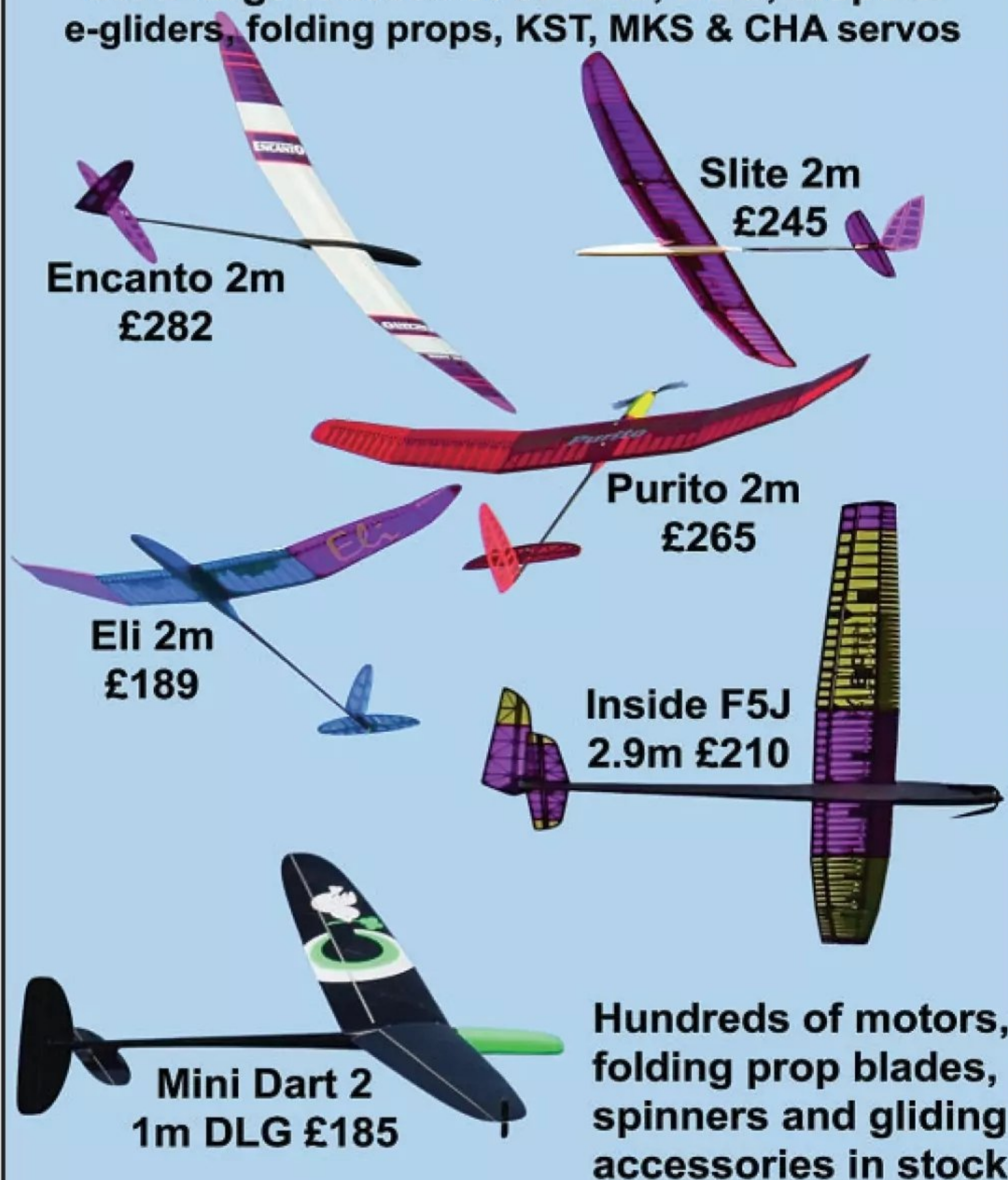
turned a blind eye so long as we 'borrowed' in moderation. Still, the seeds were sown.

Dad was an active club flyer well into his 80s when dementia, a horrible disease, started to make its presence felt. With his short-term memory badly affected, model flying, thanks to decades of involvement, was one of the few subjects that was unaffected and one of the few subjects he could talk about with real enthusiasm. Mum passed away unexpectedly 15 years ago after which model flying, backed by strong club friendships, took on a new importance in his life, something I've become more aware of as the years pass. It's really not a bad little hobby you know.

I'll see you next time and, till then justforfunrcme@gmail.com is where you'll find me. ■

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SELLING MY WHOLE COLLECTION

(My wife will be cheering and clapping in the background!)

It's my retirement time.

So, here we go with bargains that will fly out the door.

Pristine giant scale Great Planes P51, ARF NIB with retracts, £400.
Hanger 9 giant scale PT 19 ARF, with OS 120 4s, on board glow and full house, £380

Full-House Hanger 9 Texan ARF (instructor turns his head with the rudder) with OS 4s, £180.

Stunning Hanger 9 Sopwith Biplane ARF.

Full house. With 4s Saito 72. Not flown yet.

Other stuff includes Aerobatic Kestrel, scratch built, light weight, OS 100 4s, on board glow. Drago Mustang Racer, with retracts, full house and Saito 4s. NIB ARF Black Horse Spacewalker. More NIB Saito and OS engines. New glow plugs £5.0 each. Giant Vintage Biplane, full house. On-board glow, £80. Scratch built Stik on detachable floats with OS 92 2s. Free Glow starters. Free spinners and miniature spanners. Free leads and props, and, servos and stuff...



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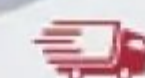
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Top letter

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



IC TO ELECTRIC COMPARISONS

As an 'oldie' who has a recollection and some experience of glow and diesel engine sizes I struggle to equate these to the new generation of electric motors. For example, I know what .40 two stroke or .52 four stroke means but I have no clue what the equivalent motor size would be.

Some motors quote dimensions, e.g. 3547, some quote watts, then there are 3S and 4S ratings, recommended propeller sizes, geared and non-geared, in-runner and out-runner and kV ratings to contend with. Added to this one has to factor in choices of LiPo voltage and C ratings, and choice of ESC. I have some awareness of what these

terms stand for but apart from try it and see, is there a rationale for determining motor, prop, ESC and LiPo replacement for, say, a .46 glow in a high wing traditional trainer? Should one go for a 3547 or would a 4735 be better?

I know that if one buys a foamy ARTF then none of this matters as someone else will have figured it out. But I still enjoy building planes. I'm a regular reader and may have missed it but can/has anybody untangled the relationship between IC and electric motor ratings.

Peter Willson

It can be confusing, I agree, Peter. Unfortunately, there is no easy answer due to the plethora of electric power products on offer. A great source of information is the 4-Max website, including the Recommended Setups section which shows many electric set ups for popular planes. If in doubt 4-Max's proprietor, George Worley may be willing to suggest a set up based on his own products if you email him with the sort of performance you are after, along with expected duration, anticipated flying weight and maximum propeller diameter, plus, if possible, a link to the model manufacturer's website. Visit: <https://www.4-max.co.uk/recommended-setups.htm> - KC

FOAMBOARD REPAIRS

Mike Freeman beat me to it in April's edition when using Hobbycraft foamboard as a cost-effective alternative to balsa and block foam (see St8us plan feature - KC).

Turning onto a landing approach with my Ugly Stick, I failed to keep the speed up and wrote off the fuselage. With the model being a foamie, I didn't want use balsa to repair it (I had no stock anyway!), but I remembered seeing foamboard in my local Hobbycraft. Priced at £4.20 for three times more than needed, it felt very light but stiff.

Construction was much as standard, constructing a box fuselage with balsa triangle section. As the weight seemed to

be on the right side, 6 mm ply was used for formers 1 to 3, as well as the undercart/front fuselage floor. At the stage shown in the picture its weight was 20 g lighter than the original. I trialled using PVA, UHU-Por and ordinary cyano and all worked well. Sanding the edges needed care but applying blue Solarfilm was a doddle with my iron at 80 degrees C and adhesion to the board was excellent.

With a slightly larger motor the C of G came out right where it should with no lead needed! The final picture shows it ready and waiting for the next low breezy day.

Mike Edgecombe



SHADES OF GREY

I have just read your excellent review of the XFly-Model Spitfire. Looking at the photos the top surface should be 'Ocean Grey', but it looks rather like a shade of blue to me. Is this just a quirk of magazine printing or have the manufacturers got it wrong... again? The underside, Medium Sea Grey and the top surface, Dark Green look fine in the photos.

Ian Nelson

The grey used on the XFly Spitfire does have a blue tinge, Ian, but I think it has been exaggerated by the print process. I had to do some touching up after ground looping the model, so I took the broken off rudder into a local Hobbycraft store to do a colour match with their Humbrol Dropper Bottles of acrylic paint. After examining the colours shown on the labels, I settled on 128 US Compass grey and 78 Cockpit Green but although they dried fairly close there was still a mismatch. I now have a LifeColor pack of 'RAF Day Fighter WWII Scheme' acrylics to try which includes Dark Green UA 547 and Ocean Grey UA 5018. I'll let you know how I get on, probably in the next instalment of my new RTFM feature. - KC



DESIGNS OF CHARACTER



It was great to see Jon Harper's Barling Bomber article in the April issue of RCM&E. I am attracted to 'nuglies' too (or 'designs of character' as I see them) and attach some photos of

my current 'challenge', the Martin Baker MB2 prototype. It's an own design scratch build powered by a Laser 150. It actually maidenied in 2023 but its development process continues -

with some way to go! It was (surprisingly) awarded Best Model at Laser's 40th anniversary bash at Buckminster.
John Dimond

SCOUT CABANES

I really enjoyed the series of Flair articles. I've just acquired a Flair SE5a kit. Lots of parts were missing but I've 're-kitted' it from my stash.

The only thing I'm struggling with is the cabanes. I have the material to reproduce them but working out the actual plan of them has me stumped.

I see in the articles that 'certain things' were

not detailed on the plans, so builders had to go to Flair to replace them. Unfortunately, drawings aren't shown for the parts I need.

Do you know of, or can you put me in touch with, anyone who can give me the cabane template?

John Featonby

Are you on Facebook, John? If so, then I would

pose your question to the 'In Celebration of Flair Models' group:

<https://www.facebook.com/groups/486113779864188/>

They have nearly 1000 members, so hopefully someone who has built a Flair SE5a will be able to help. Also, your letter here may bring a helpful reply from one of our readers.

KC

AEROBATIC TWIN

At an age of 90 plus, I have been around aeroplanes, and particularly models, in the Nottingham and Yorkshire area for decades, including helping to build the Shuttleworth Sopwith Camel.

A few years ago, I acquired a simple concentric contra-rotating propeller system and built an MX2 for it. The results were disappointing, mainly with the horrendous noise from the props, although the torque-less flying was a revolution. The thrust was not good either, although in hindsight I should have fitted a higher pitch rear prop to allow for it having enhanced airflow.

Time passed by, then my good lady started with dementia and needing constant nursing care. After 49 years as a nurse, she does not deserve this and is having difficulty coming to terms with it. Now, after a couple of years, she is in a home and being looked after so I wanted to get back into flying, having sold most of my models.

Looking for a quick replacement and usually liking something different - and, at my age, something slower - the Multiplex TwinStar

caught my eye. I had one several decades ago and considered it ideal for our grassed field. Anyway, the model went together quickly and flies well, straight as an arrow. In my opinion it's an ideal first model for a beginner.

So, what about more aerobatic designs? I am now thinking of trying another aerobatic model with contra rotating props, modern versions of which seem to work well but are expensive and in a prominent position to get damaged. I have not heard others running but the one I had made a noise like a siren!

The other option is a single engined aerobatic model fitted with twin motors of equivalent power, which gives several advantages:

- Power units are near the C of G.
- Smaller props, so cheaper and less vulnerable.
- Shorter undercarriage legs.
- Batteries can be fitted in the nose for easier access.
- The airframe outline would be basically unchanged. Existing fuselages could be used but slimmer ones may be possible.

- Twin props now give an even airflow over both wings.
- Less noise
- Knife edge loops with differential throttle.
- Downside? I cannot think of any.

I hope this at least gives your readers food for thought. Who will be the first to give an electric powered twin aerobatic model a try?

John Thompson

I was sorry to read about your wife's illness, John. My father-in-law has advanced dementia too and it's a horrible disease. But I am glad to see that you have returned to model flying with your TwinStar.

As for your call to action regarding converting an existing single engine aerobatic design to a twin using electric motors, I am sure our readers will let us know if this has been done already. There are a growing number of scale electric twins available these days, but I doubt if these will exhibit the kind of aerobatic prowess that I think you are seeking, such as you would have enjoyed with your MX2.

How about a twin Extra 300 anyone?

KC

FAIRCHILD PT-19

Here are a few pictures of my PT-19. It is from a Dynaflyte kit which has a fairly accurate scale outline. It has a few additions such as fairings, flaps and full body pilots front and rear, carved from foam, with detailed cockpits. The wing is fully sheeted and Koverall was my covering of choice, with polycrylic used to seal the weave. The plane is painted with latex and has moderate detailing and weathering. It comes in at 23 pounds and is powered by a DLE 35. My son maiden it, which was a non-event

Ed Burka, Ontario



STEAM PIGEON

As a non-flier I have built this 1/8 scale 70" wingspan Supermarine Walrus flying boat from plans. It is all balsa and plywood with a home-built engine nacelle and fibreglass floats. Electrics were supplied by 4-Max and

the pneumatic retracts are of my own design. The only item not to scale is the propeller which should have four blades constructed from two propellers.

Keith Whitfield



BIG SCORPION

I restored this 14-foot wingspan Scorpion and fitted a Zenoah 45 cc petrol engine and a Biela 24 x 8 prop. The airframe is covered in Solartex, doped and sign written, with no stickers of any kind. It has Airtop 8-inch ballon pneumatic wheels, metal gear Savox servos all-round and a 50-ounce fuel tank. It is



fitted with air brakes, which can be mixed with rudder to assist turns just like the B-52! It works very well.

It takes only a matter of 20

feet to lift off with a 10-mph headwind - and then life becomes a better place!

Pictures are by Andy Salmon.

Dave Horton

ROBIN DR400

My Robin DR400 was built from an extensively modified MFA (remember them?) kit a couple of years ago.

It weighs about 6 kg and although it has a large wing area the powerplant is only an O.S. FS-70 Surpass. There was

some concern that it might be just a little too heavy...

After waiting for our strip to dry a little bit more and, more importantly, be mowed and rolled, I successfully maiden the Robin today. There are a

couple of problems to iron out, but it flies beautifully, however take-off is rather lengthy. The all-flying-tail travel and expo were spot on. In fact, it only needed two clicks of right aileron.

Martyn Kinder





Three Glacial's together at Hurley!
Left to right: James Fallowfield,
Phil Lewis and Keith Jackson.

FIRST F3A EVENT OF THE YEAR

Keith Jackson reports from the first BMFA centralised competition of the 2025 aerobatic season and also reviews the latest copy of a must-read book for those interested in R/C aerobatics

Words: **Keith Jackson**

Photos: **Keith Jackson, Bryan Hebert, Beryl Gooch**

The first event of the UKF3A competition season took place at the Plane Crazy Model Flying Club which is a popular flying site in the Midlands managed by Steve Carefoot. Aerobatic competitions have been run at this site for many years as the flying area is second to none in terms of quality, accessibility and facilities. Also, Steve and his band of merry modellers run a mean barbeque for competitors and judges alike which serve to make for an enjoyable day out.

The 1st Centralised event has been run at Hurley for several years now, ably managed by club and UKF3A member Adrian Harrison and supported by key individuals to ensure smooth running of this busy competition. In fact, entry



Models, pilots and judges in action at Hurley. WiFi routers behind the judges supported the Nautomatic scoring system which allowed the competition to proceed quickly.

Pilots at the BMFA 1st F3A centralised competition held at Plane Crazy MAC, Hurley.



Steve Smithy with his lovely Skyleaf Leader biplane in the bright morning conditions at Hurley.

into these events is much easier these days since model processing has been dropped. This used to involve measuring and weighing each model and battery combination for electric powered aircraft, which brought complexity and delay to the proceedings, not to mention a small army of volunteers to facilitate these checks. These days most models are sourced from ARTF kits supplied by BJ Craft, Hui Yang, CK Aero or similar and are guaranteed to fit within the two-metre length and wingspan specifications. Flying weights are also comfortably below the 5.5 kg requirement which all means that considerable time can be saved.

The aforementioned time saving is important as these events can become quite long days. The entry was typical at 15 pilots, comprising seven entries for P-25, six entries for P-25 and F-25 and two entries for Masters. With each flight lasting eight minutes, over three rounds,

this translates to six hours of flying which, with breaks and lunch, means finishing around 4 pm at the earliest. One key time saving is the Nautomatic automatic scoring system in which the judges use wireless handsets to enter scores which are automatically processed and the pilots ranked for each round. This represents a major reduction in the effort need to run events like these and has only become viable due the perseverance and hard work of some key individuals within the UKF3A organisation.

FIRST UP

First flight of the day belonged to Masters pilot Steve Smithy flying his new Skyleaf Leader biplane powered by a Dualsky CRS 3000 contra drive. This is a model I am very familiar with having flown a Leader biplane for three years and this model presents very well. Steve's version was just as good and he put in a strong flight to score 405 points, which works out to an average of 75% of the total score achievable for the Masters schedule. In fact, Steve's score was all the better considering the bright morning sun was well within the flight area, meaning the model appeared as a silhouette for much of the flight.



Internals of the Skyleaf Leader biplane showing the CRS3000 contra drive and D3 ESC.

Steve went on to win the Masters group with Graham Gooch taking the runner up spot with his trusty BJ Craft Element.

FAI P-25

Following the flights from the two entries in the Masters class the competition progressed quickly into the largest category, FAI P-25 which featured seven entries. This category saw a welcome return to the fold from Dave Matthias, a previous UK team member



Receiver location rearwards of carbon components to prevent RF shielding. Powerbox Digiswitch V3 with twin LiPos for power.

Dave Matthias' BJ Craft Epilogue caught mid-flight by ace photographer Beryl Gooch.



and Nationals Champion. Dave was flying his BJ Craft Epilogue driven by an R220 motor turning a 20 x 13 three blade propeller. Dave flew his model very well, with a high average score of 468.5 in the final round which represents 76.8% of the maximum score available.

The P & F category flew two rounds of the FAI preliminary schedule P-25 and one flight of the finals schedule F-25, with the best two scores counting. Flying standards in this category were pretty high, as was expected with three (multiple) nationals champions and four UK team members participating, with an average score of above 80%. Second placed pilot Dan Workman scratch built his own model, based on top US pilot Andrew Jesky's Proteus monoplane design, and had only 25 flights prior to competing at Hurley. He flew fantastically well to win the F-25 round with an average score of 85%! Third place went to Kevin Caton flying his newly acquired Hui Yang built Skyleaf Leader A1 design, taking the first P-25 round with a score of 509.75 points.

Ken Moss in the ready box, waiting for his flight with his BJ Craft Epilogue / Adverun contra drive system.



Dave Matthias took top spot in the FAI-P25 category.



Brian Hoare with his lovely Skyleaf Leader biplane. He flew in the FAI P-25 class to take third place overall



Graham Gooch competed in the Masters class with his BJ Craft Element.



Peter Madden with helper Yazz flew this Muscle Cloud biplane kitted by BJ Craft. Huge 24" propellers are now becoming the norm driven by the Dualsky CRS3500 contra drive system.



Third place this time for seasoned F3A pilot Kevin Caton.



Top spot was taken by Brandon Ransley flying his Skyleaf Leader G biplane.



Jim Fallowfield with his Lassi built Glacial v3. Note the closed loops on the elevators and rudder.



Dan Workman took runner up position with his home-built Proteus monoplane.

Top spot in this category went to Brandon Ransley who flew consistently well though all three rounds, winning the second P-25 round and narrowly missing the final round. Brandon flew his aging Skyleaf Leader G biplane powered by an Adverun contra drive turning Falcon 22" propellers.

James Fallowfield flew in this category with a Lassi Nurila Glacial v3 biplane which was the very model featured in a YouTube video Lassi released showing it being constructed entirely using CNC machining technology. I believe this video is no longer available but a similar video



Interior of the Proteus showing the high degree of building that Dan undertook.



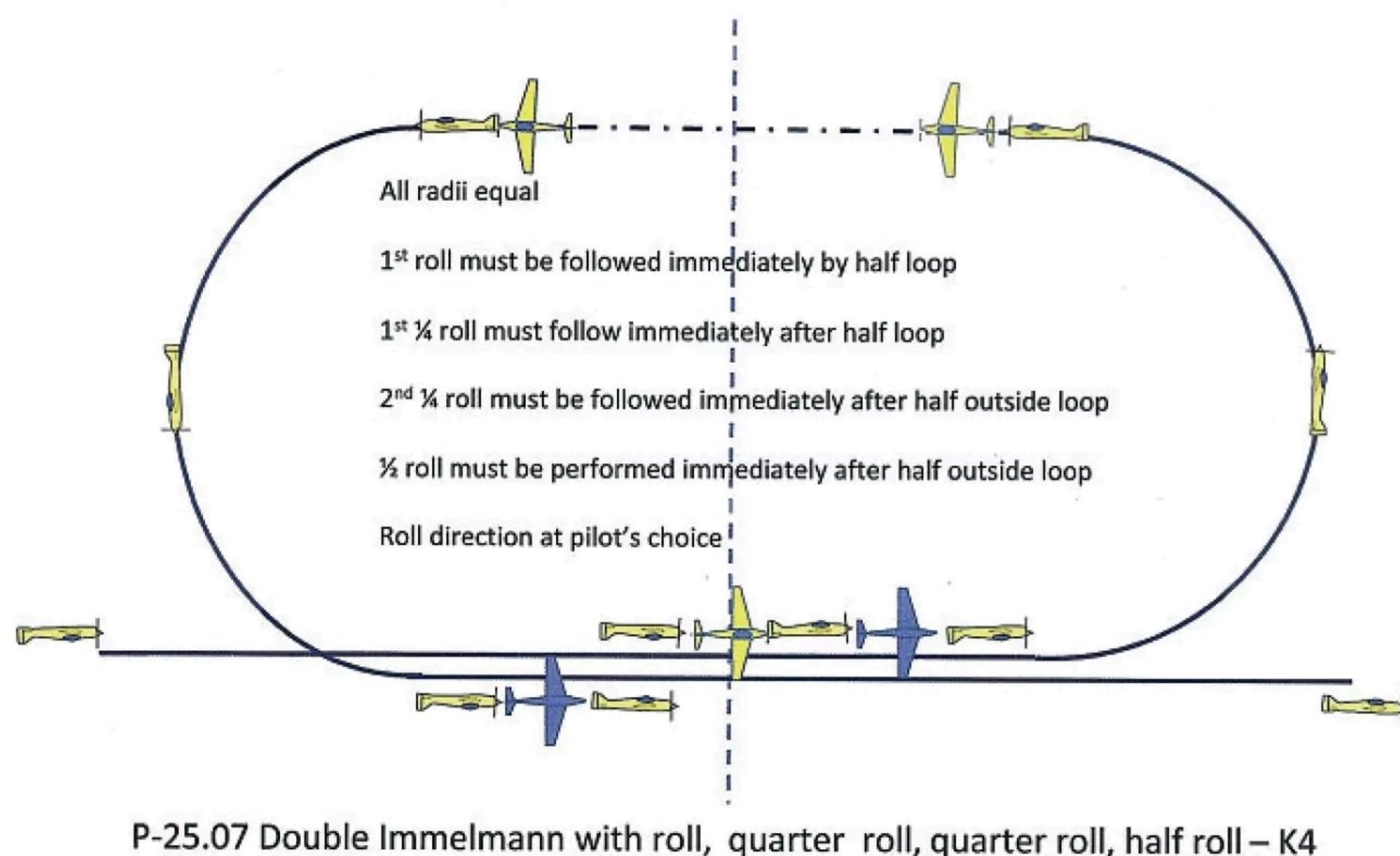
Interior of the Muscle Cloud showing the Dualsky CRS 3500 contra drive installation.

can be viewed on Lassi's YouTube channel. It was built to a phenomenally high standard featuring a significantly deeper fuselage than the current Glacial design. James had installed an Adverun contra drive for power turning Falcon 24" propellers!

Peter Madden flew the first version of the BJ Craft Muscle Cloud to be flown in the UK, powered by the Dualsky CRS 3500 contra drive system. F3A enthusiasts will have seen this model demonstrated by top Spanish pilot Juan Rombaut in several superb videos online (www.youtube.com/watch?v=rfo2WjuxStw). The model quality and finish were very good, especially considering the price point of the kit.

FLYING STYLES

In general, flying styles haven't changed much for a few years. With the P-25 being a relatively easy FAI schedule and the F-25 being



F3A manoeuvres are clearly explained in Peter and Kevin's book.

the converse, it is sometimes quite difficult to separate the best flights in the former category. Consequently, there is currently a lot of emphasis on the positioning of flights being at exactly 150 metres from the pilot's position, with flights further out than this frowned upon. Fly beyond 170 metres and your flight will definitely be downgraded. Controlling heading changes entering and exiting manoeuvres is also key to getting a good score. It is easy to become blasé about these requirements for F3A flights and it is not until you attempt to do this rigorously that it becomes evident how difficult a skill this is to master. Finally, the ability to obtain a constant speed to present

the model well during your flight is now a requirement under FAI rules (see https://www.fai.org/sites/default/files/sc4_vol_f3_aerobatics_25.pdf - ANNEX 5B).

BOOK REVIEW

'Advanced Precision Aerobatics Edition 2' by Kevin Caton and Peter Jenkins

The very brief points mentioned above concerning flight requirements are covered beautifully in the latest edition of Advanced Precision Aerobatics, co-authored by Kevin Caton and Peter Jenkins. This latest edition is based on the first excellent edition with added features to cover flying through the current A-25 (Masters) and P-25 schedules. The judging section (Chapter 10) presents sufficient information for the new or experienced pilot to grasp what the judge does and how they achieve it. Links in the chapter point to sources of further, more in depth information. Each

Skywalker design by CK Aero.



Advanced Precision Aerobatics Edition 2

A Guide to the FAI A25 and P25 Schedules

Kevin Caton & Peter J Jenkins



Advanced Precision Aerobatics Edition 2 by Kevin Caton & Peter Jenkins.



Tail group installation is entirely conventional on the Skywalker.

chapter in the book is like this and at no point does the text become overwhelming, which makes it very readable.

I was glad to see a more in-depth description of Flight Coach being included as I feel this system is a very important component of modern F3A and dovetails with the need to improve accuracy and positioning to do well in the modern competition.

The description of P-25 manoeuvres is very good and would definitely help the pilot concentrate on those hard to achieve details that separate an average manoeuvre from an outstanding manoeuvre. I particularly liked the list of downgrades that accompany each manoeuvre drawing, especially the Double Immelmann which is my own particular bugbear!

Edition 2 is now available to buy via Amazon.co.uk at a price of £26.99, or direct from Peter at peterjenkinsbmfc@btinternet.com, which gives a 20% discount on the RRP.

CK AERO SKYWALKER

Bryan Hebert, founder of CK Aero has been in F3A for a lifetime and that experience, coupled with superb build quality, finish and attention to detail is found in all of the models he produces for the aerobatic market. In addition to numerous designs that Bryan has created, CK Aero also offer a huge variety of accessories including propellers, spinners, landing gear, radio gear, tools, trimming aids... The list is quite expansive and their website (www.ckaero.net) is well worth a look, showing how the USA side of aerobatics is approached. Bryan's is also one of the few companies that offer a complete service for YS engines, for those pilots who still love the sound of a supercharged four stroke!

Bryan's latest design is the Skywalker, which is a no nonsense, fully composite monoplane design squarely aimed at the new entrant to



Skywalker is a big model, with scale provided by Bryan's wife Almira.

“Bryan's latest design is the Skywalker, which is a no nonsense composite monoplane aimed at the new entrant to F3A”

F3A but capable of flying though the latest knife edge manoeuvres found in F-25. A comprehensive description is available on the website (www.ckaero.net/products/skywalker) along with a video where Bryan talks through the many features of this new aircraft. It is important to mention that the robust construction of the model allows the use of either electric, glow or petrol engines.

The main features include

- Improved paint quality - stronger and less brittle
- Fully reinforced carbon fibre nose for any power solution
- All new wing and stabiliser platform
- Pre-hinged wings and stabilisers
- Beautiful hand painted finish, fully customisable ■



SLINGSBY SKYLARK 1

Chris Williams introduces part one of his latest Pro-Plan article describing the build of a 1950s Slingsby glider

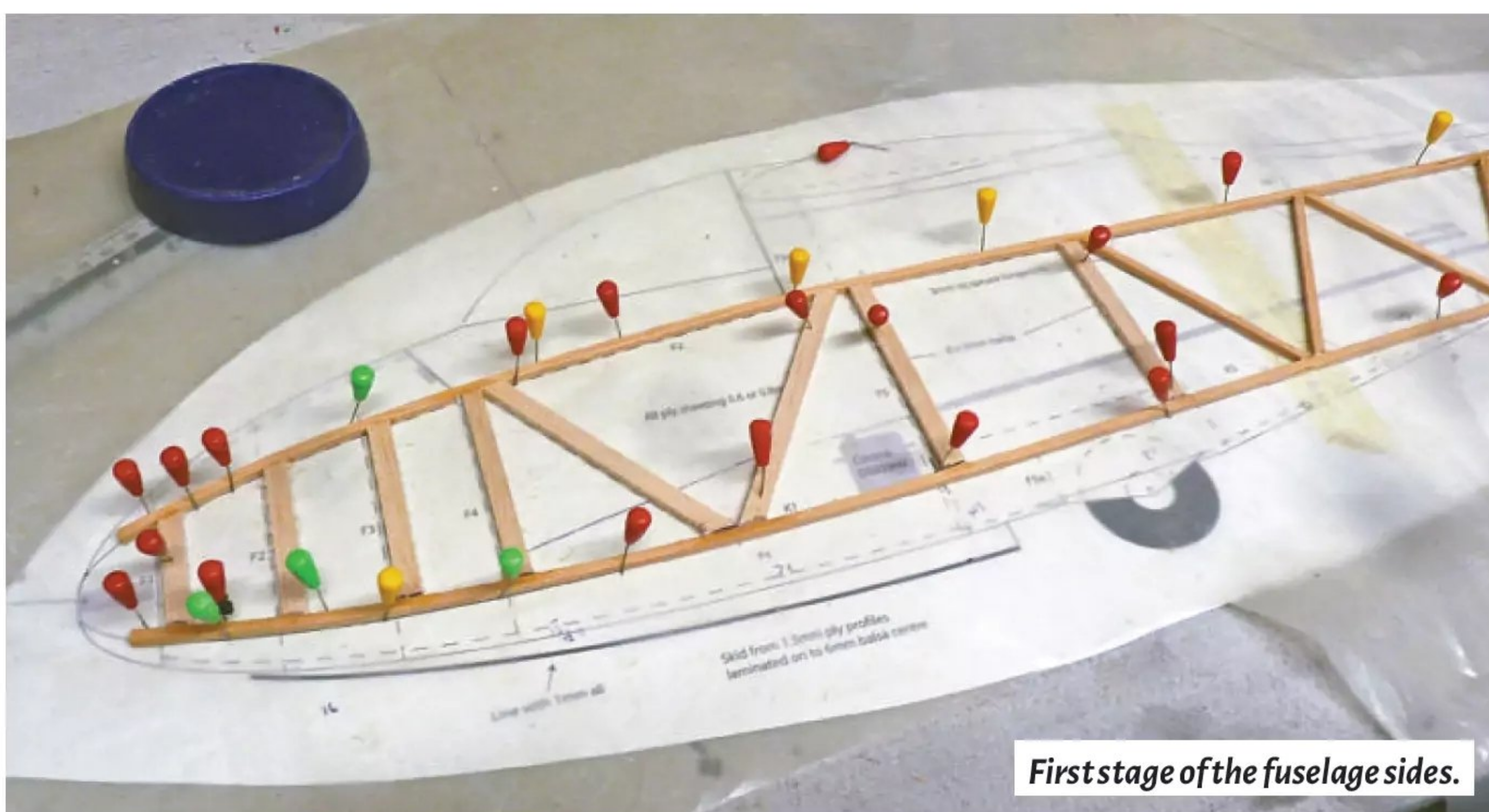
Words & Photos: **Chris Williams**

The Skylark 1 made its appearance in the 1950s and was to precede three future Skylark types, culminating in the Type 50 Skylark 4. At one-sixth scale it's a very handy sized glider and fits nicely with my previous types at this scale.

DEVIATIONS FROM SCALE

The full size did not have a wheel but used a dolly instead so it shouldn't be too difficult to modify for those of a purist disposition. As this is a fairly small model and the wing loading needs to be kept low the airbrakes have been left out of the equation and the glide path control shifted to the ailerons, which are programmed to lift simultaneously when the occasion demands. Also, the wing mounting pylon has been widened to help contain the strain from any side loads, such as an emergency crosswind landing on the slope.

Note that although small in size this glider needs as much building as any larger model. So it's definitely not a Kwik-Build design!

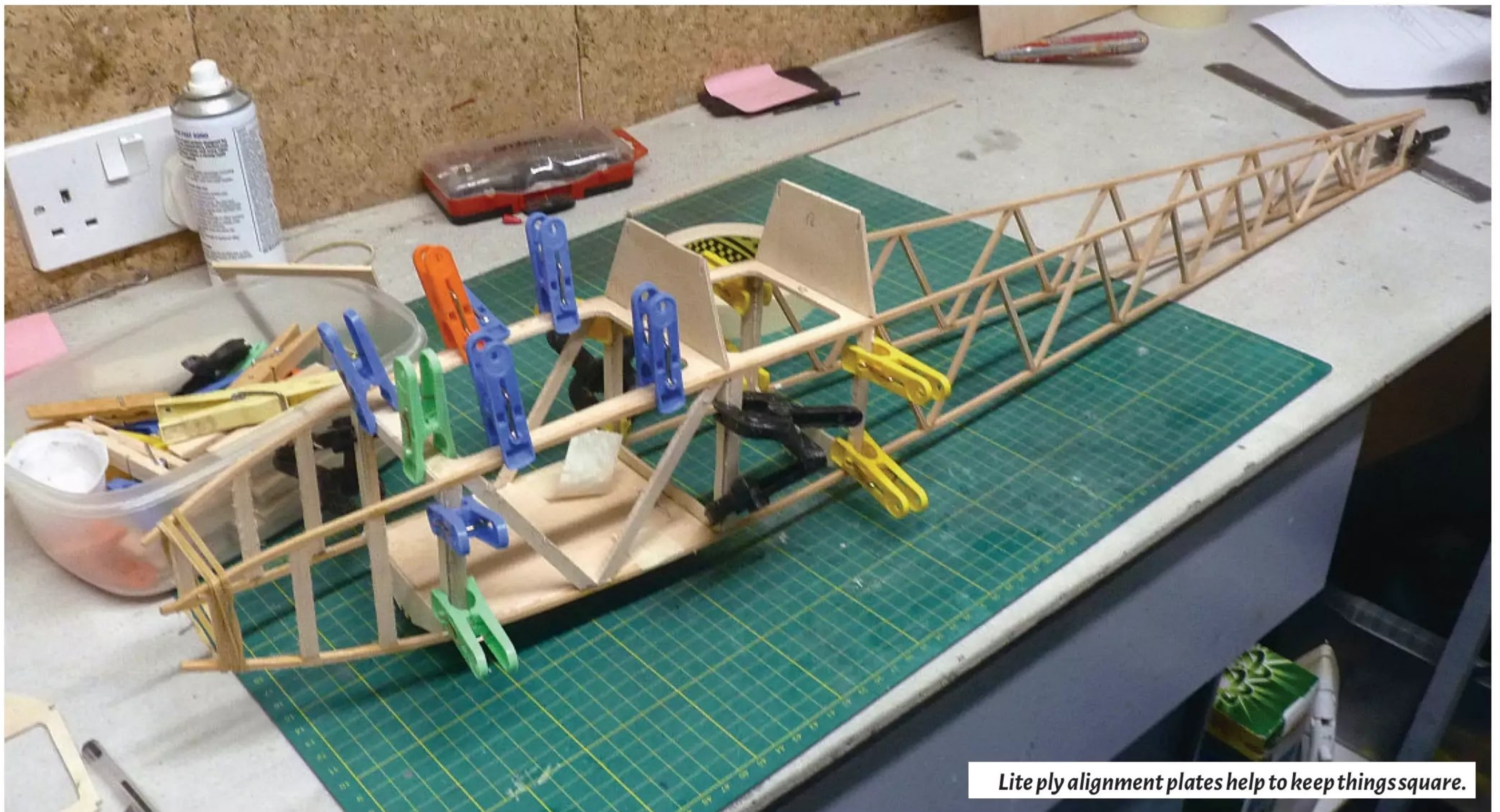


First stage of the fuselage sides.

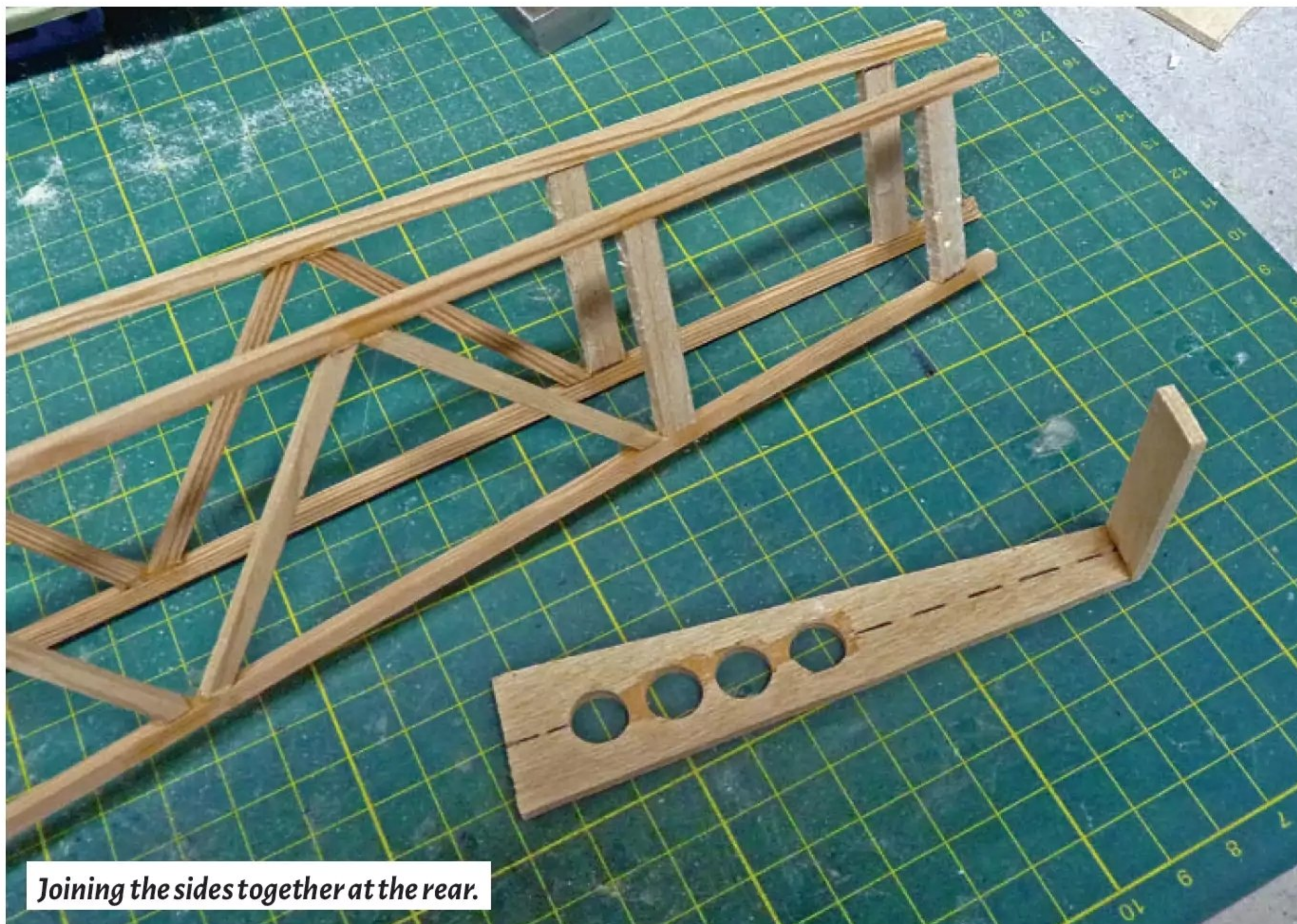
FUSELAGE

The first job is to make up the slab sides over the plan. As the 3 mm square spruce longerons

are liable to split if bent too far it's advisable to steam them to shape at the front before construction commences. The 3 x 6 mm balsa



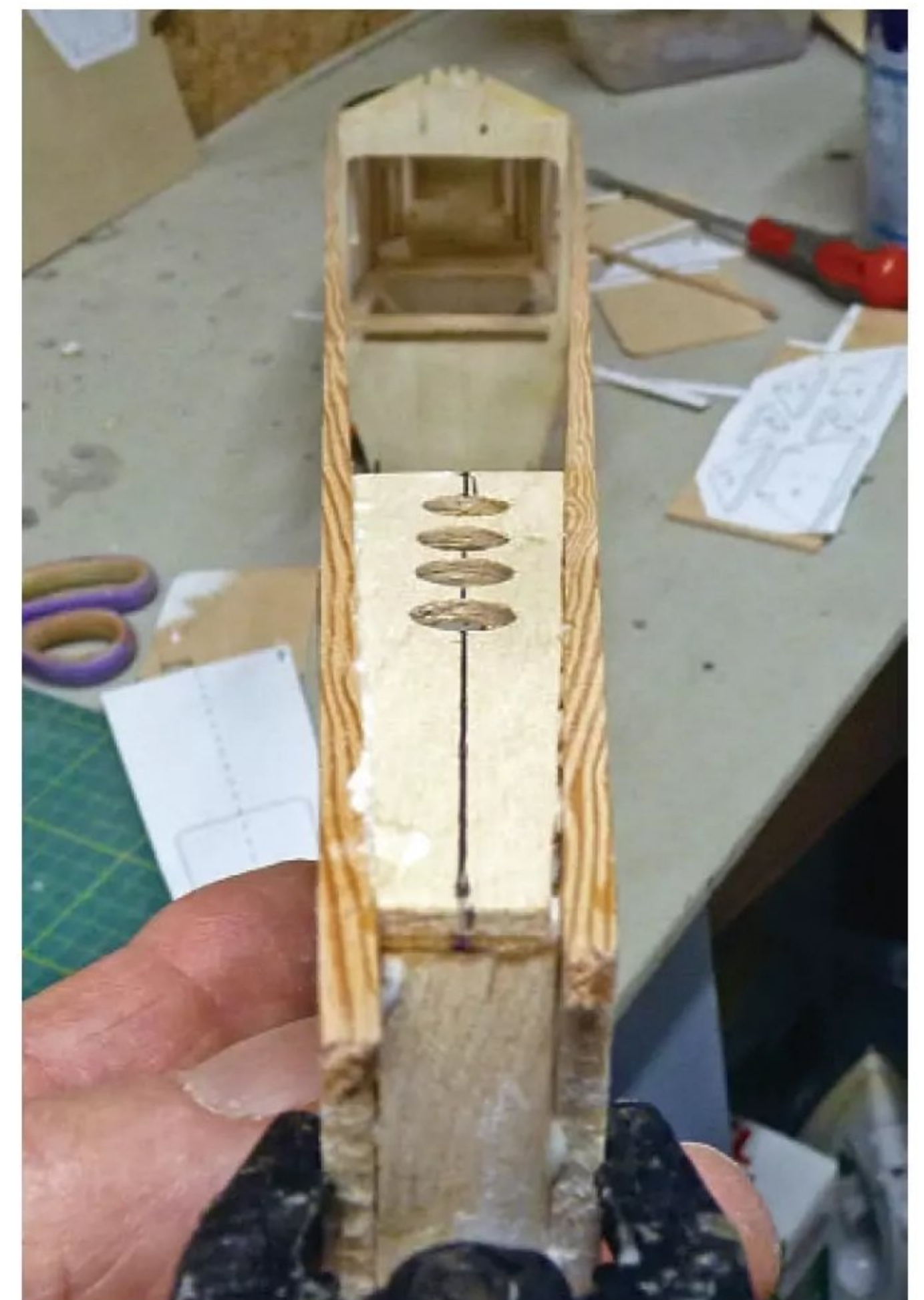
Lite ply alignment plates help to keep things square.



Joining the sides together at the rear.

“As the spruce longerons are liable to split if bent too far it’s advisable to steam them to shape before construction commences.”

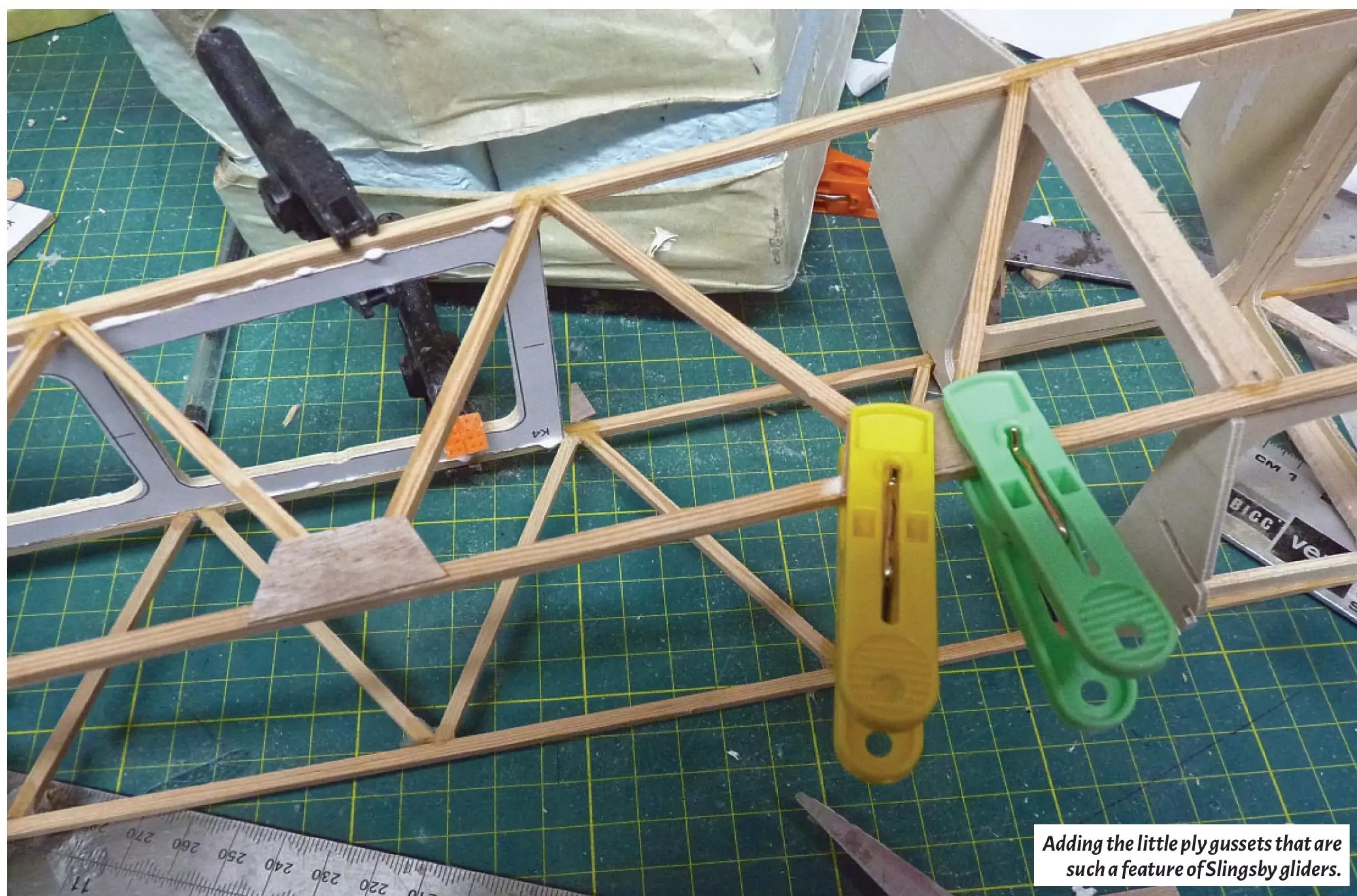
uprights serve to line up the positions of the formers at the front. Once the two sides are completed their initial joining starts with the use of the K1 - K3 horizontal spacers, which serve to line up the fuselage sides properly. When the PVA has dried, glue in the front formers one at a time, allowing the glue to dry before tackling the next one. Care will be needed when it comes to gluing in F1 as the spruce longerons will be at their bending limit. It was found that setting up a few wooden splints (lolly sticks!) made it easier to close the sides together, top and bottom at F1. Coupled together with masking tape, the longerons can be eased into their places on F1.



Centre lines help to keep things straight.

When installing the wheel brackets, trim the lower K3 to allow ingress. Add the little ply gussets to the fuselage sides at the rear before adding the top formers and keel as this will allow you to sand their outer edges flush with the longeron. When closing together the sides at the rear use centre lines drawn on the K4s and eye up to check that the rear of the fuselage is straight.

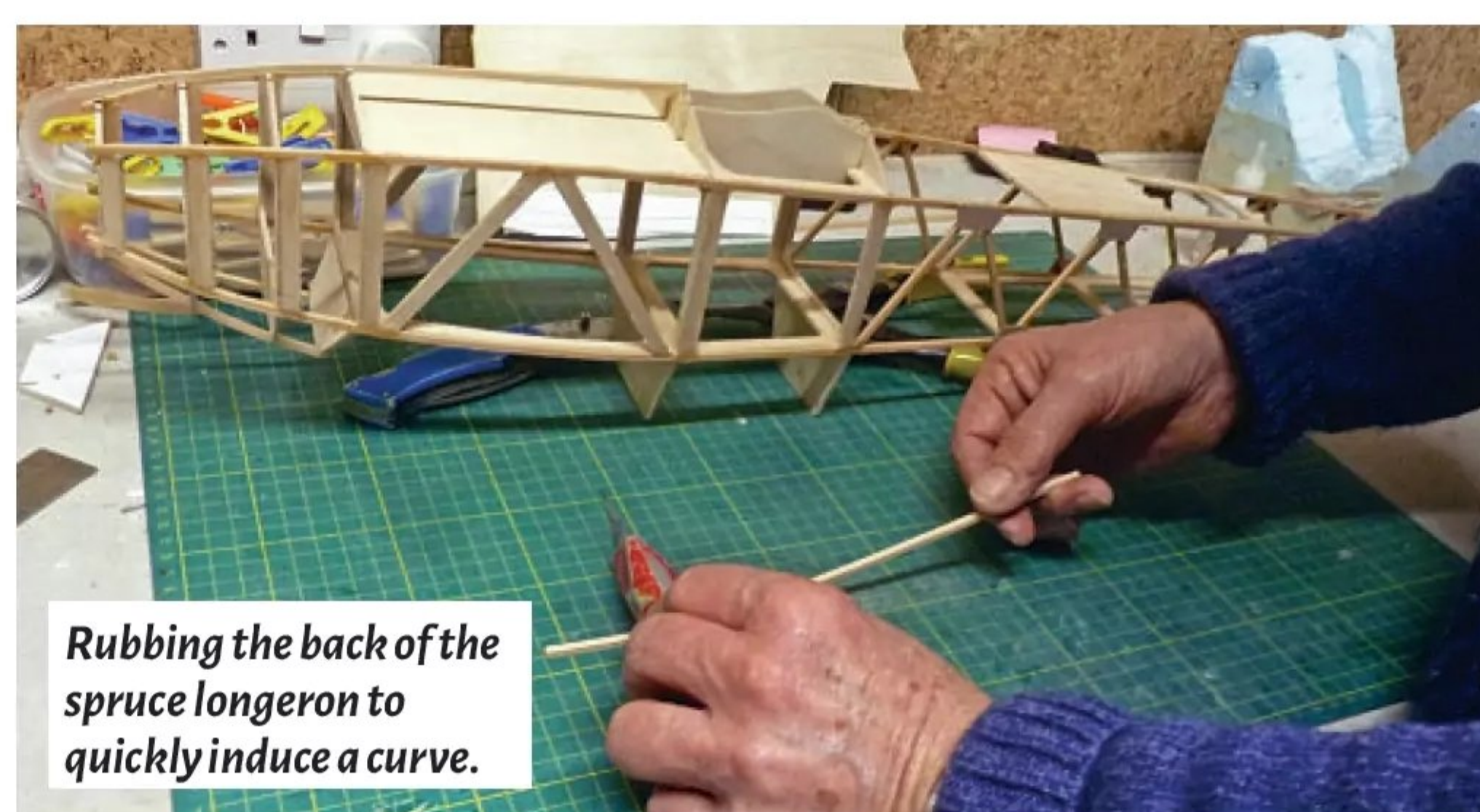
The 1.5 mm ply spines on top of the fuselage at the rear come together with the ply wing seats and at F10, where they share the slot. Add the 5 mm balsa pieces upon which the tailplane will sit and sand at the front to match the



Adding the little ply gussets that are such a feature of Slingsby gliders.



Front end view.



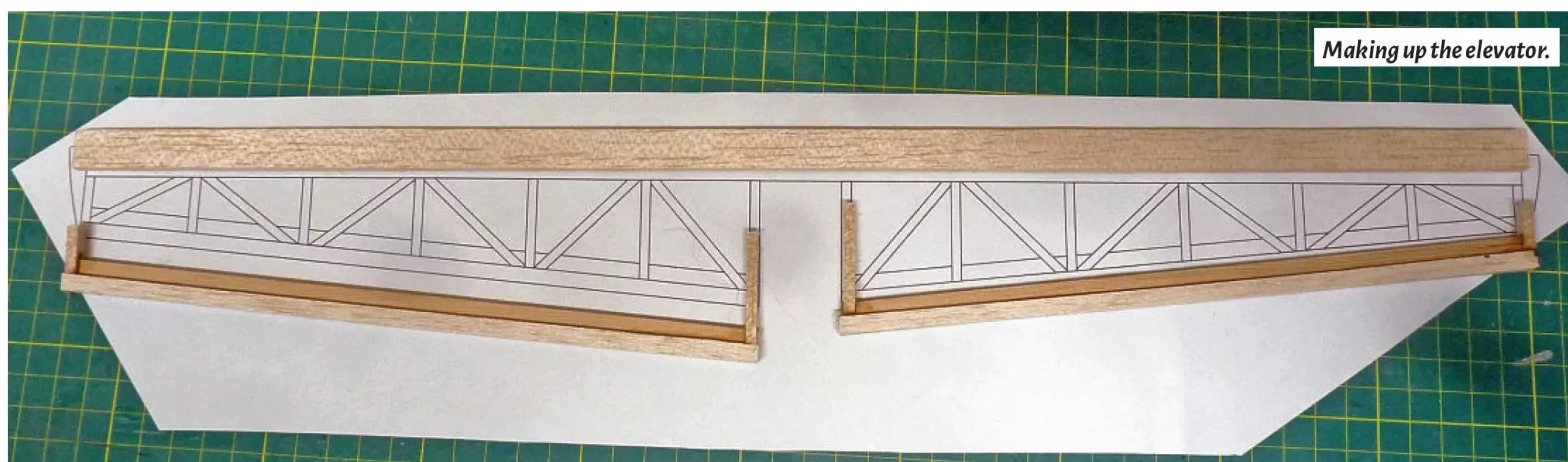
Rubbing the back of the spruce longeron to quickly induce a curve.

shape of the top of the fuselage. Fill in at the front and where the retaining bolt will sit, with balsa, ensuring that the result is parallel with the longerons underneath.

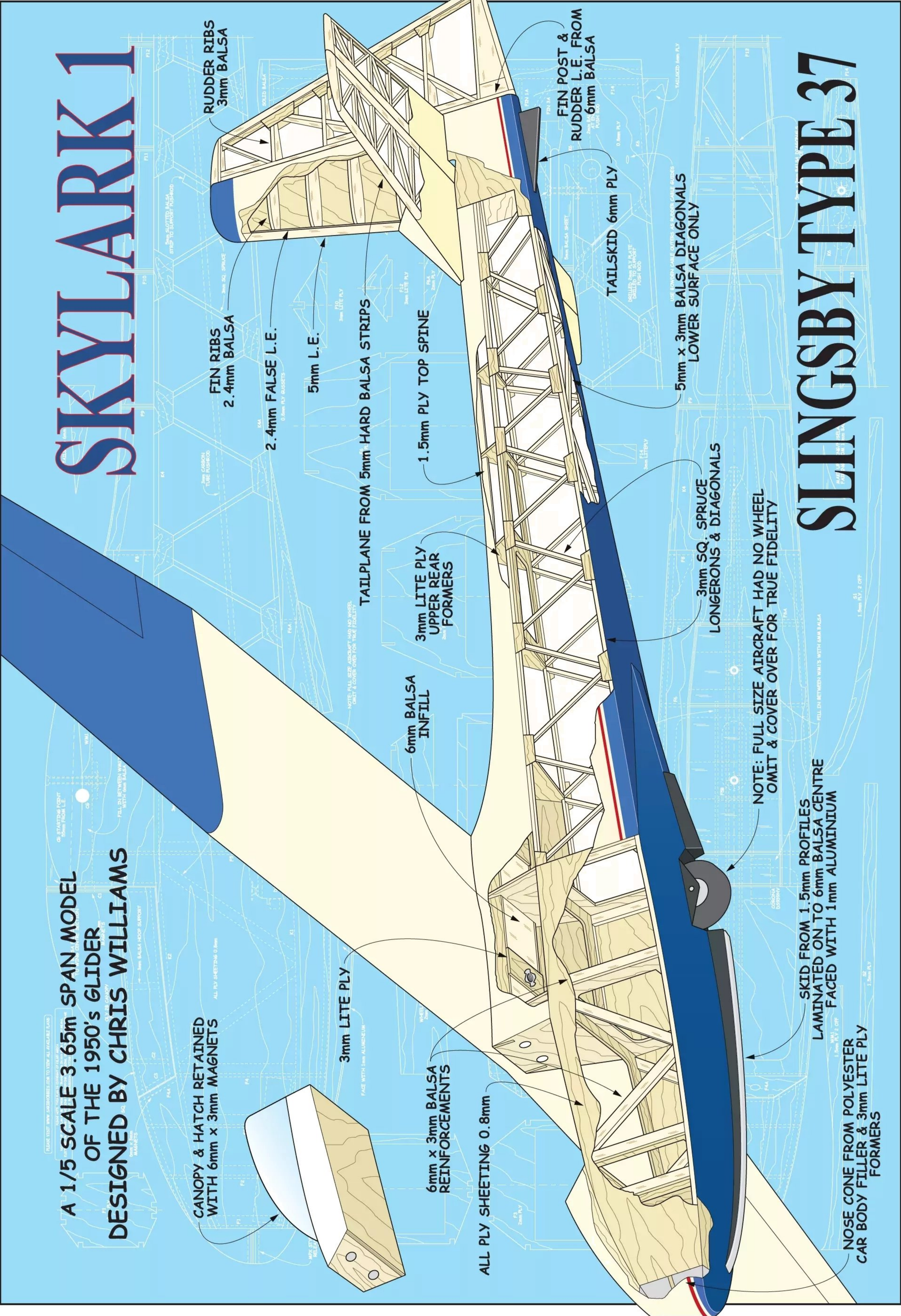
TAILPLANE

The tailplane is built flat over the plan with prepared strips of hard balsa. Add the parallel ribs first and then fit the diagonals and the tips.

The elevator is also built over the plan but because of the slotted ribs it needs a slightly different approach. Make up the basic elevator with root and tip ribs, then proceed to make ✈



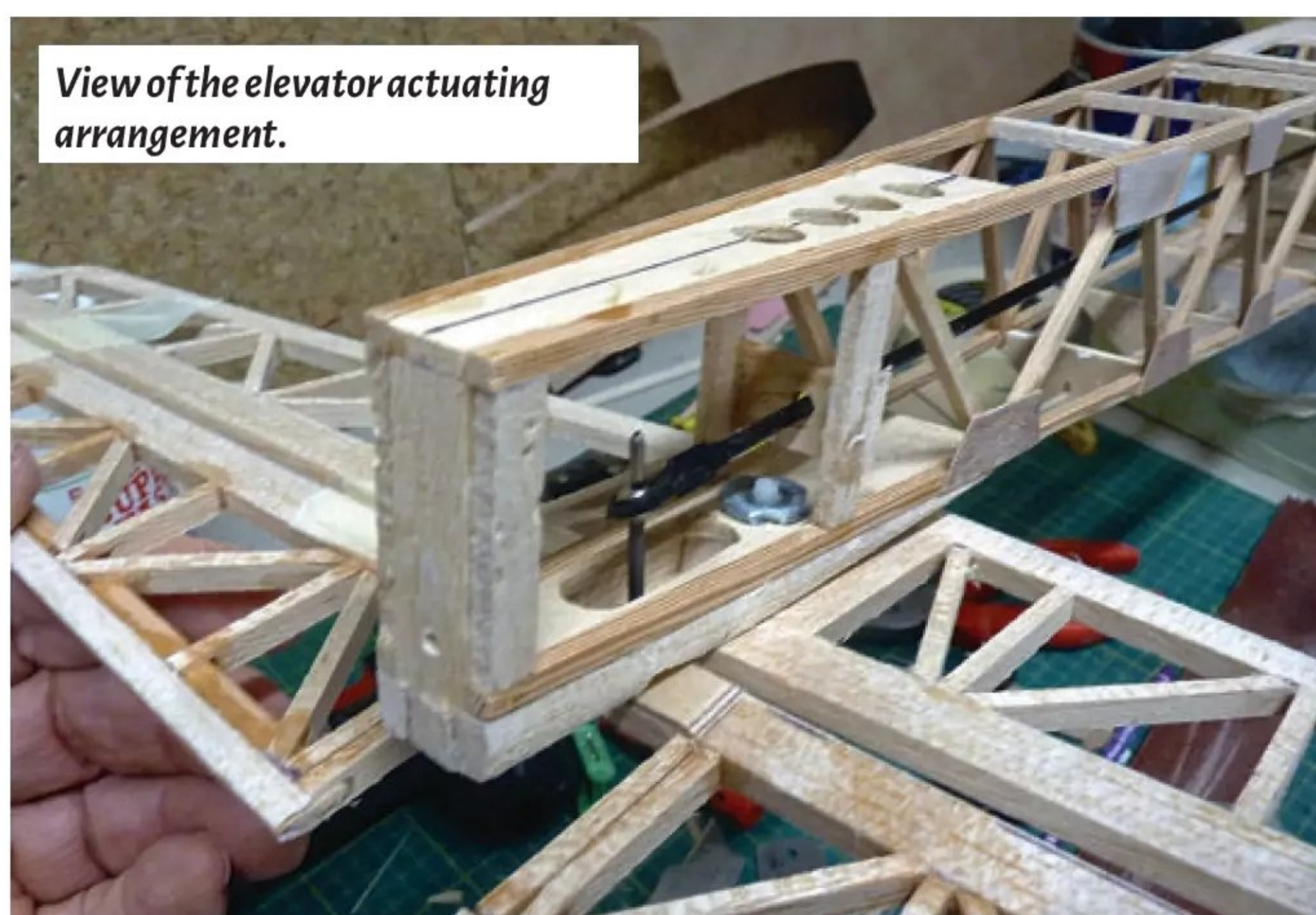
Making up the elevator.



Adding the ply sides to the fin.



View of the elevator actuating arrangement.



Angling off the 3 mm square balsa infills prior to sheeting.



up and fit the ribs from the outside in. The slots in the ribs can be easily made with two hacksaw blades glued together.

Dry fit the first rib and diagonal, then make up the next rib and diagonal before using cyano to lock the previous ribs in place.

FIN & RUDDER

The fin is made up 'in the hand' with reference to the plan. Clamp the fin post to the fuselage and cyano in place the bottom rib, using masking tape to prevent it sticking to the fuselage. Remove and add the top rib and false LE before adding the remaining ribs. Fit the balsa

reinforcing blocks for the hinges and then apply PVA to both ply sides at the same time to avoid any twisting. Keep checking throughout the whole process to ensure that things stay straight.

FUSELAGE CONTINUED

Once the rear of the fuselage has had the balsa fill-ins added offer up the tailplane and drill through for the 4 mm plastic retaining bolt. Use a metal bolt and washer to tighten up the captive nut into the lite ply after drilling out to 6 mm to allow its ingress.

This would be a good stage to add a 1.5 mm ply plate to make up a floor between F1 and F4

for installing the battery as access is somewhat limited after the ply sheeting has been added. Add the top and bottom ply sheeting using card templates to ascertain the shape of the parts. Note that 0.6 mm ply was used on the prototype but if not available use 0.8 mm ply. For ease of marking out the lower sheeting is joined at F5, so double up the area with balsa to increase the gluing area.

The nose cone is made up from solid car body filler. Make up the 3 mm lite ply profiles first. Glue in place and then add the filler in three or four stages, sanding flush with the ply. When at the 'fitting of the ply' stage,



Getting ready to sheet the fuselage's lower surface.

allow it to protrude slightly at the front to give the filler more material onto which it can grip.

If you are fitting a tow release drill out the 10 mm hole (or other appropriate size) in the

“The nose cone is made up from solid car body filler”

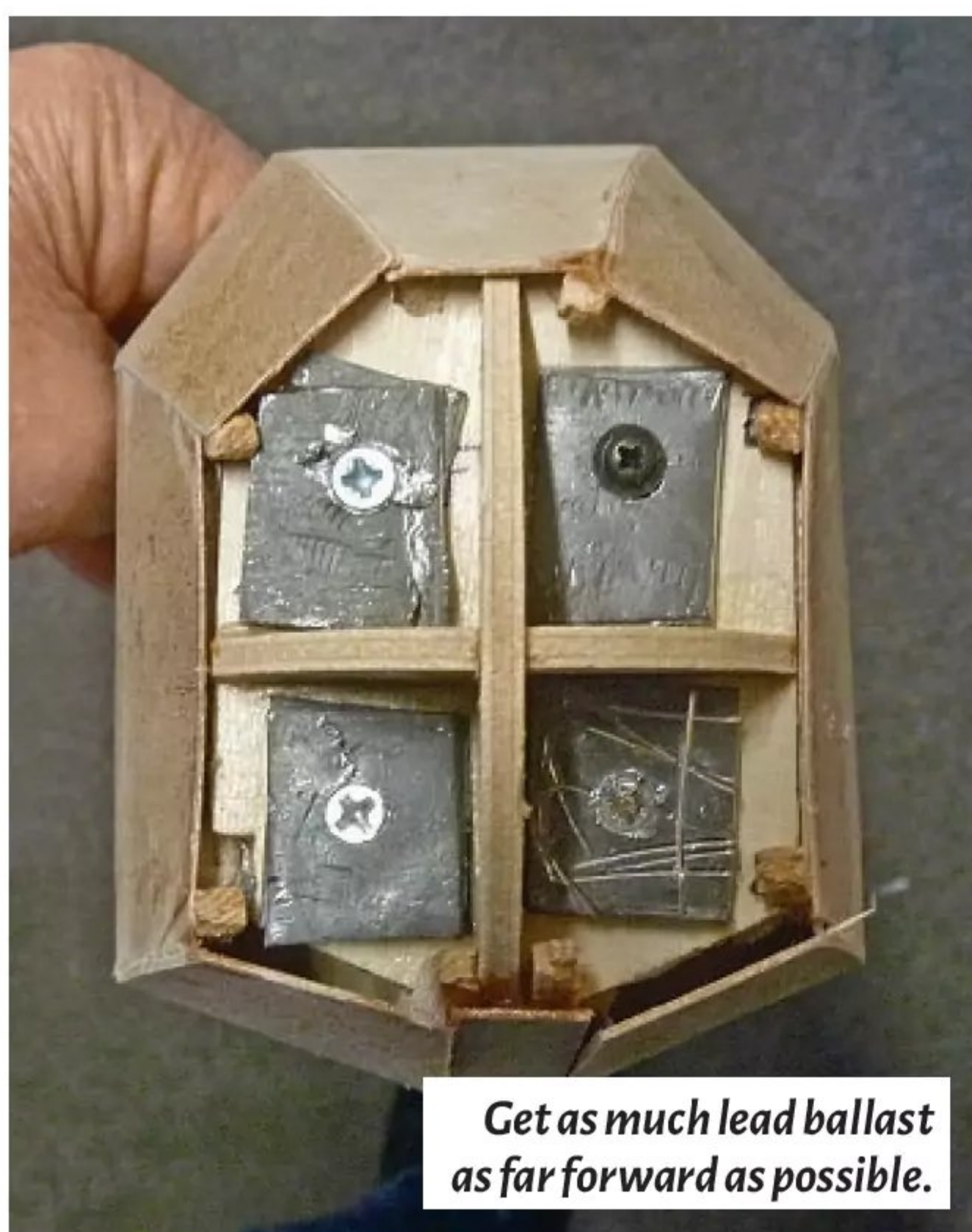
centre of the nose. At this stage a series of flat lead plates weighing approximately four ounces, taped together, were glued to the rear of F1 with Sikkaflex polyurethane sealer. As space is tight the hole drilled through the lead was lined up with the original drill bit as a guide to push it through the hole in the nose into the correct place.

WING CENTRE SECTION

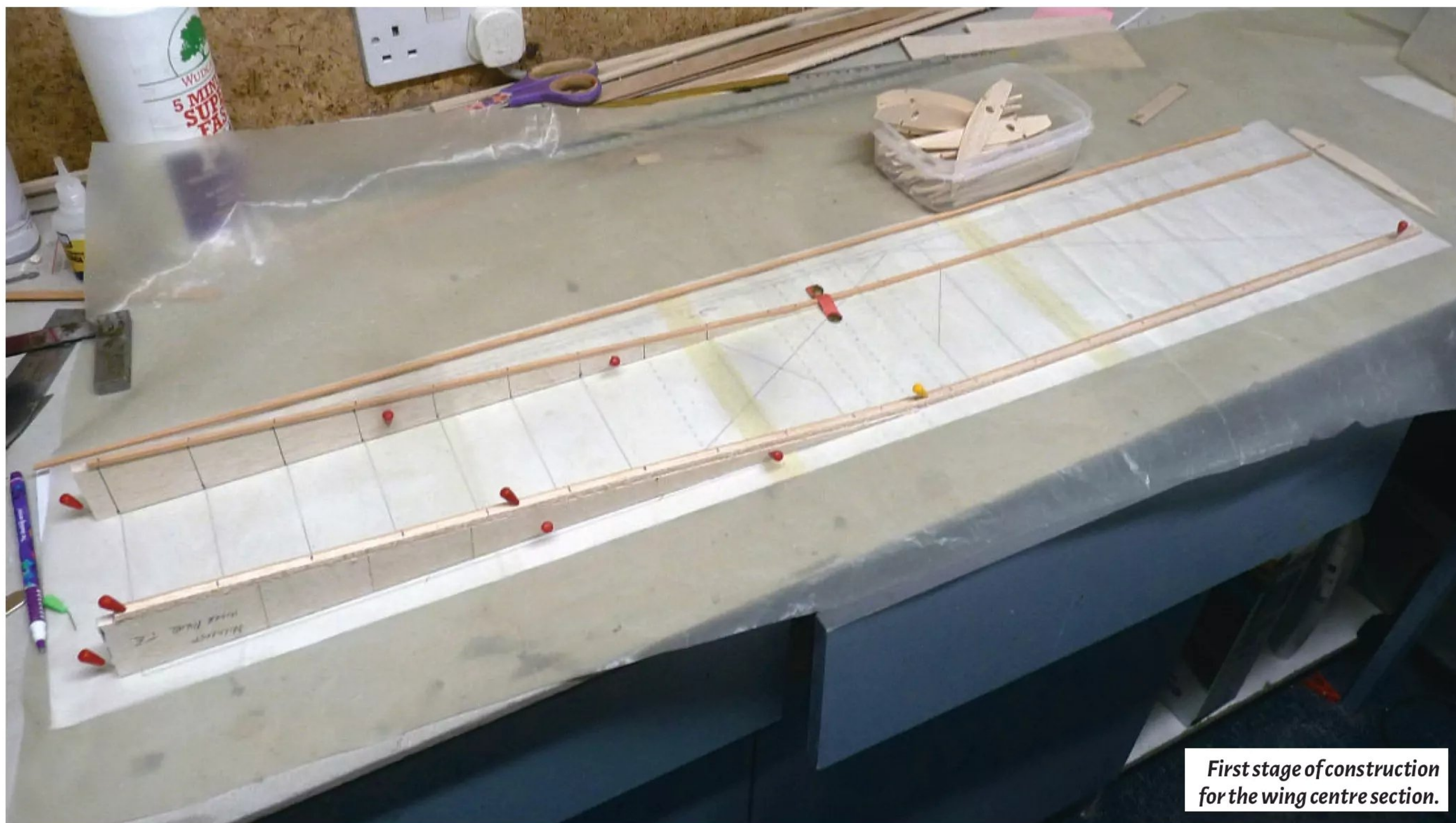
If, like me, you have limited bench space, it's a good idea to make up all the major parts of the wing, especially the strip wood, before you start. This is a relatively simple job as the components of the three-piece wing fit comfortably within standard 48" lengths of wood and there are no tapered elements. One half of the wing is built flat to the board, while the other half is supported by two tapered jigs to induce the dihedral.

Start by marking out the rib positions on the lower 3 mm sq. spruce spar and the trailing edge (TE). Then pin the dihedral supports in place, add the TE and the lower spar, which should be packed up around 1.5 mm on the flat section. Add the ribs, followed by the top spar and the false leading edge (LE). Cut a small notch in the centre of the LE to assist in taking up the dihedral. Add the ply triangles to the rear of the ribs and enough ply web plates to lock the spars in position. Remove the wing from the board and add the remaining web plates.

The 11 mm brass boxes at the ends of the centre section are a tight fit between the spars so a different way to fit them had to be found. Make up the ply plates that will sit either side of the box and epoxy the brass box between them with a small slice of spruce or ply to fill the small gaps between the spars. In the likely event that the resulting box is over size, trim to achieve a snug fit between the spars. 0.6 mm ply will give almost the correct 3 mm width but if, like the prototype, you use 0.8 mm ply this is easily sanded back with the box in a vice. Now, the boxes can be epoxied in place between the spars with ply plates either side. Make up the second ribs at each end by gluing longer ply



Get as much lead ballast as far forward as possible.



First stage of construction for the wing centre section.



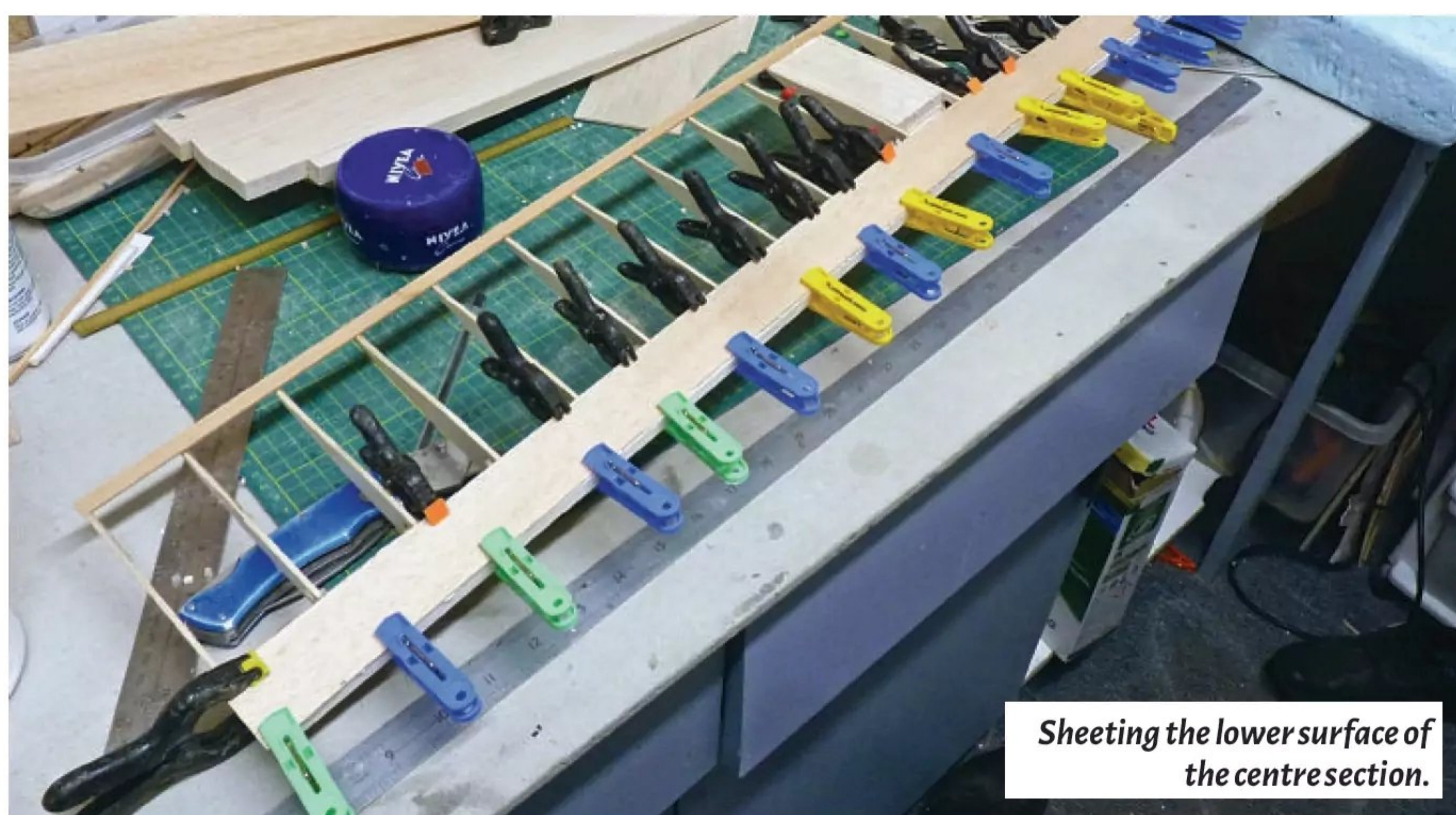
Adding the first stage bits and pieces.



Adding the top sheeting with the wing jiggged up.



Fixing one of the captive nuts for wing retention.



Sheeting the lower surface of the centre section.

triangles to encompass the incidence pin tubes and glue them into place.

Now the sub spars can be added. Offer up the 3 mm sq. spruce sub spar in front of the ply webbing plates and mark out for the cut in each rib. Cut these slots with a junior hacksaw and cut the other side with a Stanley knife before gluing the spars in place with PVA. Cut the slots on the top of the wing by slightly more than 3 mm to allow for the curve of the ribs.

Fill in the gap between the centre ribs with solid balsa, leaving a gap at the front on the underside for the aileron servo leads. It might



Skylark 1 can be hand launched from the slope or aerotowed for flat field flying.

be easier to make up blanks cut to the aerofoil shape and glue together. The lower sheeting can be added in one piece, after which the wing can be weighed down on the jiggling supports and the top sheeting added. Make up the 0.8 mm ply facings for the tip ends and finish off by adding the 1.5 mm cap strips to the ribs. Drill through the wing for the front 5 mm plastic bolt and add the captive nut. Use a strip of 2 mm ply across the lower surface of the balsa on the fuselage to reinforce this area. Then, using the centre line to aid alignment, drill through and fit the second bolt and captive nut. The fairing in the centre/front of the centre panel can be

made up from 12 mm balsa blanks once the cockpit frame is made up and to which it can be referenced.

At this point it's a good idea to bolt on the wing and check the decalage before finalising the rear end.

TO BE CONTINUED

The Skylark 1 construction feature will continue in the August issue.

As usual, for those cutting their own parts, the PDFs are just an email away from the author, as is the complete sequence of build pics: c_williams30@sky.com ■

DATAFILE

Name:	Slingsby Skylark 1
Model type:	Scale glider
Scale:	1:5
Designed by:	Chris Williams
Wingspan:	3.65 m (143.7")
Weight:	8 lbs (3.6 kg)
Wing section:	HQ35/14 centre section, tapering to HQ35/12 in outer wing panels
Functions (servos):	Ailerons (2), rudder (1), elevator (1), tow release (1)
Glide path control:	Via up-lifting ailerons

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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
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PPL-60C5S-4500	60C/120C, 5S (18.5V) 4500mAh	£86.50
PPL-60C5S-5000	60C/120C, 5S (18.5V) 5000mAh	£96.00
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* XT60, ** XT90 on battery side



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

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Osprey F5J glider. At around £1000 this is as about as cheap as you'll find for a near four metre span carbon composite thermal soarer. But don't expect any instructions on how to put it together!



READ THE FLIPPIN' MANUAL

Kevin Crozier kicks off an occasional series of features from the Editor's hotseat

Words & Photos: **Kevin Crozier**

I've been mulling over writing something semi-regular from my perspective as RCM&E's editor for quite some while. My main incentive is to give myself a gentle kick up the backside with regard to my own personal modelling projects, some of which I hope will be of interest to our readers, plus reveal a few 'Bucket List' projects that I am starting to gather old kits, parts and plans for when retirement beckons in a few years.

I also intend to give updates on some of the kit reviews that are ongoing behind the scenes, as well as catching up with some of the products and aircraft covered in past

issues, especially those that warrant a bit more coverage than the space allocated for most reviews usually allows.

However, it's probably best not to get too prescriptive about things so let's just go with the flow and see where things take us.

GREAT PROCRASTINATIONS

As I said above, one of the biggest incentives in writing an occasional piece for the magazine is to give myself a firm but gentle nudge regarding the completion of a small number of models that I have purchased in recent years. With a busy job, a growing number of lovely

grandchildren to enjoy spending time with and too many other hobbies and interests, these days I find it far too easy to put my model building on the back burner. And when I do find a spare bit of time to put something together, I invariably take the easy way out and resort to assembling a foam model for some instant gratification.

With this in mind I was minded to imitate John Stennard's simple but descriptive moniker for his column, 'The Insider' which neatly describes his area of interest, indoor models and flying. So, there was a lot of temptation to simply give these occasional catch ups



After a couple of smaller composite slope soarers this Infinity Evo F5J was my first really serious carbon build. Again, no instructions but the importer at the time, Neil Jones, provided lots of advice and encouragement, resulting in a reasonably (for me!) quick build. It still took a few months though!



Whilst assembling the Osprey I went through a really bad period of procrastination, not helped by the absence of those all-important instructions. Fortunately, my flying buddy, Steve Hannon took pity on me and finished it off. It was ready to fly just a few short weeks later.

“Unfortunately, a high retail price these days almost seems to guarantee a complete lack of any meaningful instructions”

the catch all name of ‘The Procrastinator’. That neatly sums up the current state of affairs regarding my model building, particularly with regards to those traditional wooden constructions gathering dust in my workshop, as well as some wooden ARTFs that require a bit more in the way of assembly than a state-of-the-art foam aeroplane. Fortunately, I didn’t need to procrastinate for too long to rule that title out!

WHAT’S IN A NAME

However, I did need something to describe these musings and so I settled on the one thing sticks out to me as being the most likely reason for any hiatus in model building. The phrase ‘Read The Flippin’ Manual’ is a fair representation of my current mindset – or at least it would be if those kits I am currently struggling to complete even had one!

Many years of writing kit reviews has drummed into me the necessity to put together model aeroplanes as closely as possible to the way the manufacturer intended. In that way if anything goes wrong (which thankfully it rarely does, especially with modern offerings) then it removes the obvious retort that the model should have been assembled as instructed. So, I’m afraid that I’m a bit of a slave to instruction manuals and I struggle to make headway if they are lacking in detail or, as is all too common these days, there are no instructions included at all.

With 50 plus years of model building under my belt then I’m pretty confident of putting together a set of wooden wing ribs, spars, fuselage formers and longerons, and making a half decent airframe without any words showing me the way. But put a ready built



This JPS-3 Racer kit costs £159.99 and comes with a well-illustrated instruction manual. So, it’s difficult to understand why kits costing six times or more come without even just a few notes to aid assembly!



Despite the excellent instructions provided with the JPS-3, I still suffered from periods of downtime. It was enjoyable to put together though, with its veneered foam wings, balsa fuselage and sheet tail. It took me right back to the 1980s!

model in front of me, especially one made with a high degree of composite materials, and I become a gibbering wreck. And the

more expensive the model becomes, the more reluctant I am to make a start on it without any guidance. Unfortunately, a high retail

price these days almost seems to guarantee a complete lack of any meaningful instructions. The models I am talking about are mostly large aerobatic aircraft and composite gliders

aimed at experienced pilots. But even those of us with lots of traditional building experience need a bit of help to put together a modern composite aeroplane.

IT'S ALL ONLINE

No, it's not!

Picking through the meagre offerings on some manufacturer's websites, if they have one, and reading between the lines of forum posts, some of which are useful but which all too often veer off topic in an attempt to show how clever the posting member is, are no substitute for a decent set of instructions. Nor do casual comments by some kit producers to download the instructions for another model "because that one is quite similar to model X" cut the mustard either.

Anyway, enough of the moaning about instructions, or rather lack of. Let me put my soapbox away and start things rolling by catching up with one of those dormant models that I need to spend a lot more time on over the coming few months.

"I would probably simply copy the outlines of each servo mounting plate onto fresh ply and make up new ones"



You've got to be pretty brave to take a Dremel to a pristine epoxy glass fuselage like this one! But helped by the picture of the orange model I now have an idea of where to start.



An F3A competition standard Epilogue on its landing approach. I wish I had remembered this picture earlier as it shows the orientation of the front inlet holes as well the position of some of the oval outlet holes just aft of the wing.

EPILOGUE 1900

Top of my 'To Do' list is the gorgeous BJ Craft Epilogue 1900, which is sold as a 1.8 metre span practice airframe for F3A aerobatics. The 1900 in the title actually refers to the model's length at 1.9 metres. I wrote an unboxing article about this stylish model in the April 2024 issue and promised further articles

about building it before concluding with a flying report.

I'd like to say that progress has been rapid but in truth the opposite has happened, although the wings and tailplanes have been fitted out with servos and their respective control surfaces hooked up. I did start work on the fuselage, which involves cutting out several air inlet holes

in the front of the one-piece fuselage, with a series of outlet holes further back, but came to a grinding halt after covering the areas to be cut with masking tape and plotting out the holes using the stencils provided. But with no instructions to help me out I dallied over which way up the front air inlet slots should be and how many cooling holes were needed and



One of the Epilogue 1900's immaculate wing panels. Of all wood construction, with sheet balsa skins, the servo well awaits cutting out.



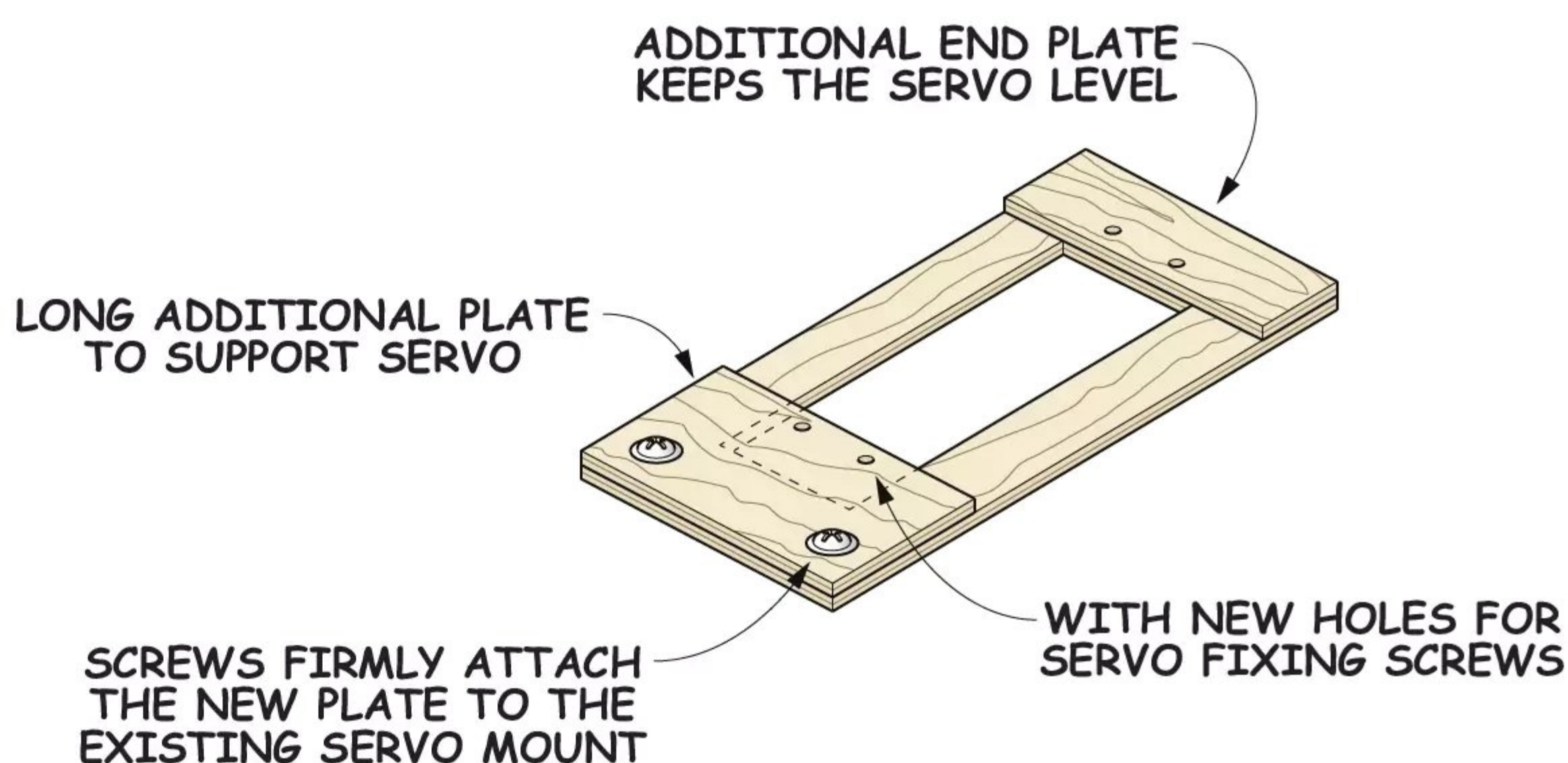
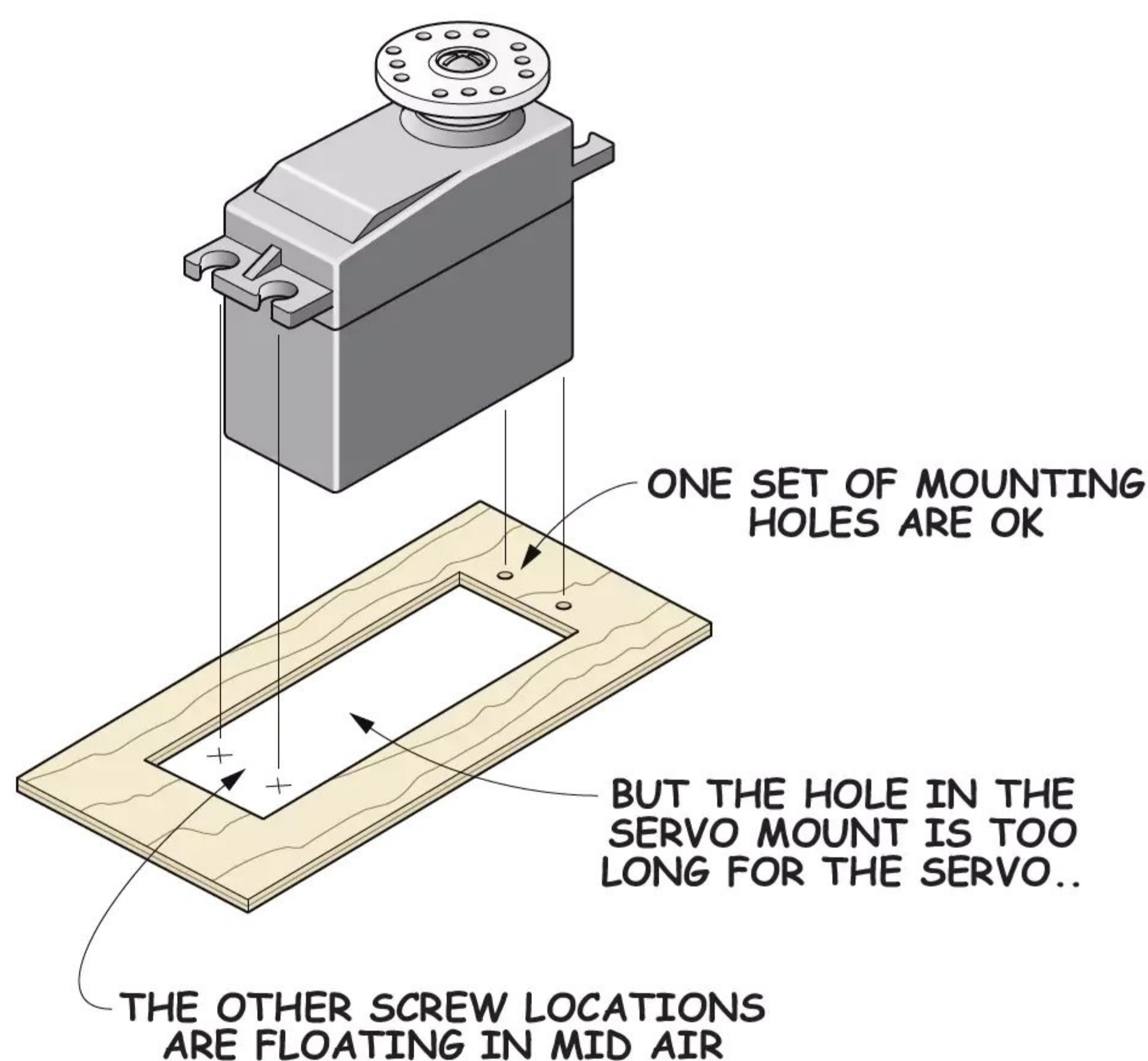
The two tail panels just before going under the knife. I wish I could cover a model as well as this.



One of the wing servos sits astride its laser cut mounting plate. You can see that screws dropped through the mounting holes will not all bite into wood if left like this.



Ditto the elevator servos. Note the use of longer control horns at the tail to reduce control movements compared to the shorter horns used for the ailerons.



Sketch showing the fabrication of additional mounting plates to support all the servo's screws.



Final aileron servo installation showing the extra mounting plates. A side benefit is that a notch is not required to make way for the cable when inserting the servo.

in which location they would be best placed. There were some posts about this online, mostly concerning the Epilogue's bigger F3A competition sibling, but of course all that did was to give me a reason to put my Dremel down, pull off all that carefully marked out masking tape and wallow in yet more procrastination...

WING & TAIL SERVOS

I'll come back to cutting the holes in the fuselage at a later date, hopefully sooner rather than later if my cunning plan to use these scribbles as an incentive pans out.

But let's kick thing off with a look at how I fitted the wing and tail servos, which I hope will be of use to those of you about to embark on a similar kit with open servo wells to fill.

The first thing to do is to locate the servo wells in the underside of each tail and main plane. The flying surfaces of this BJ Craft kit are finished to a very high standard and it seems a shame to have to cut into the neatly applied heat shrink film, but needs must! Since the covering dips over each servo well the required openings are easy to locate and each well was soon opened up, making sure to use a new, sharp scalpel blade.

Servo mounts, laser cut from thin plywood to match both types of servo well, small for the elevators and larger for the ailerons, are provided. But the holes in each one, whilst sufficiently wide for the AGF-RC servos supplied by Bondaero, the UK importer of BJ Craft kits, were too long and so some additional ply plates were made up for the servo screws to bite into.

At one end of the supplied servo mount, holes were made for one pair of servo screws to locate into. But at the other end of the servo the mounting holes were hovering over thin air. So, an additional ply plate was made up, with holes for the second pair of servo mounting screws at one end with another pair at the other to firmly attach the additional plate to the servo



It might only be a small elevator servo, but I still used all four mounting screws. Six if you include the two screws used to fix the additional plate to the original servo mount.

mount. An extra ply plate was made up for the first set of mounting screws to make sure the servo was raised equally at both ends. If all this sounds a little confusing, then please refer to the drawing on the previous page which should help to explain things.

With the servos now mounted securely to their mounting plates attention turned to gluing the mounts inside their respective servo wells.

The walls on each side of the wells are opened up with large oval holes, presumably to help save some weight. But in these areas, this leaves the servo mounting plates without any support at all. This is not too bad for the wing servos as the well walls still provide plenty of wood to attach the mounts to. But the tail servo mounts are left without much of a structure to adhere to, not helped by the thinness of the servo mounts themselves. So, after initially gluing the plates in place with medium cyano (removing the servos beforehand) and leaving to cure, I mixed up some 30-minute epoxy and brushed it a thin layer all over the mounts and the insides of each well which toughened things up considerably, making sure not to get any resin inside the pre-drilled holes. However, if I was to do it all over again, I would probably simply copy the outlines of each size of servo mounting plate onto fresh ply and make up new ones, properly sized to hold each servo.

HINGES & PUSHRODS

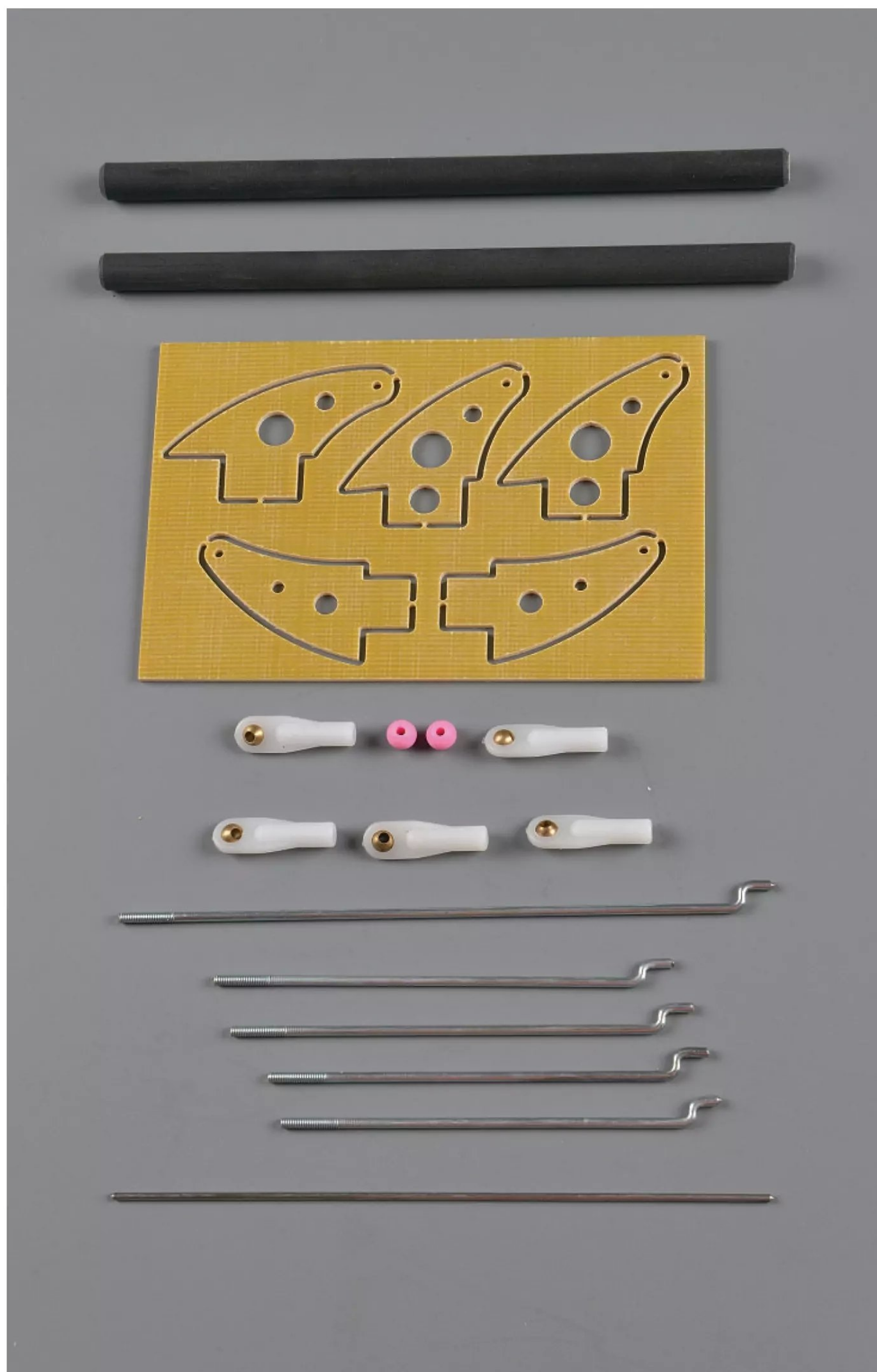
The control surfaces for the Epilogue 1900 are mounted using laser cut hinges made from furry Mylar. Each hinge has two slots into which thin cyano is carefully wicked. You only need a few drops to hold the hinges in place, so don't go mad otherwise your fingers might become permanent attachments to the aeroplane...

It always amazes me how you don't see thin cyano running and making an escape until it's too late and your fingers are well and truly stuck!

The control horns for this model are made from CNC cut epoxy sheet, with different types



Laser cut furry Mylar hinges. Note the slits which provide an effective way of wicking cyano into the wood when inserted into the panels and control surfaces.



Control horns shown still attached to their epoxy glass carrier sheet, plus the wire pushrods and matching ball-links.

provided for the elevators, ailerons and rudder. They come still attached to the master sheet with thin tabs, as per the picture nearby. The two long ones are for the elevator whilst the shorter ones are for the ailerons. This leaves a single horn of a different type which, using my powers of deduction, means that it is destined for use with the rudder.

With no instructions to guide me on which type of horn was which, I took a look at the BJ Craft Anthem build thread on RCM&E's modelflying.co.uk forum. Written by Peter Jenkins, a past contributor to the magazine, it

contains a wealth of useful advice and images, some of which can be cross-referenced to the Epilogue build. I noted that Peter used the long horns for the Anthem's elevators, so I duly did the same. (I have also found Keith Jackson's build photos of his BJ Craft Fantasista 70 in recent Aerobatic Scene columns a tremendous help too.)

The kit comes with a pair of handy jigs to ensure that the slots for the horns are cut at the correct angles and at the correct distances from the leading edges of each control surface. After marking out each slot I chain drilled a series



One of the aileron horns fitted neatly in its slot in a control surface.



And here's one of the elevator horns. Slotted-in horns work really well but be sure to rough up the tabs at their base to give a firm grip for the adhesive used.

of holes and joined them by sanding the slot with a Perma-Grit needle file. After roughing up the tabs that sit inside the slots, I glued each horn in place with 30-minute epoxy, cleaning away any excess that oozed out using a tissue moistened with acetone.

The servos are attached to the control surfaces using wire pushrods with Z-bends pre-bent at one end. The Z-bends are used at the servo arms, whilst ball links are supplied to connect the other end of each pushrod to its control horn.

WORDS' UP!

I've run out of the usual allocated word count for features in RCM&E (2000 or thereabouts, if you're interested) but I'll return shortly with more building notes, a closer look at some crash repairs to a foam warbird and fitting the same aeroplane with a three-axis gyro. ■

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A lovely model - the Topper, not me! It flew every bit as well as it looked, a testament to Albert Hatfull's design skills.

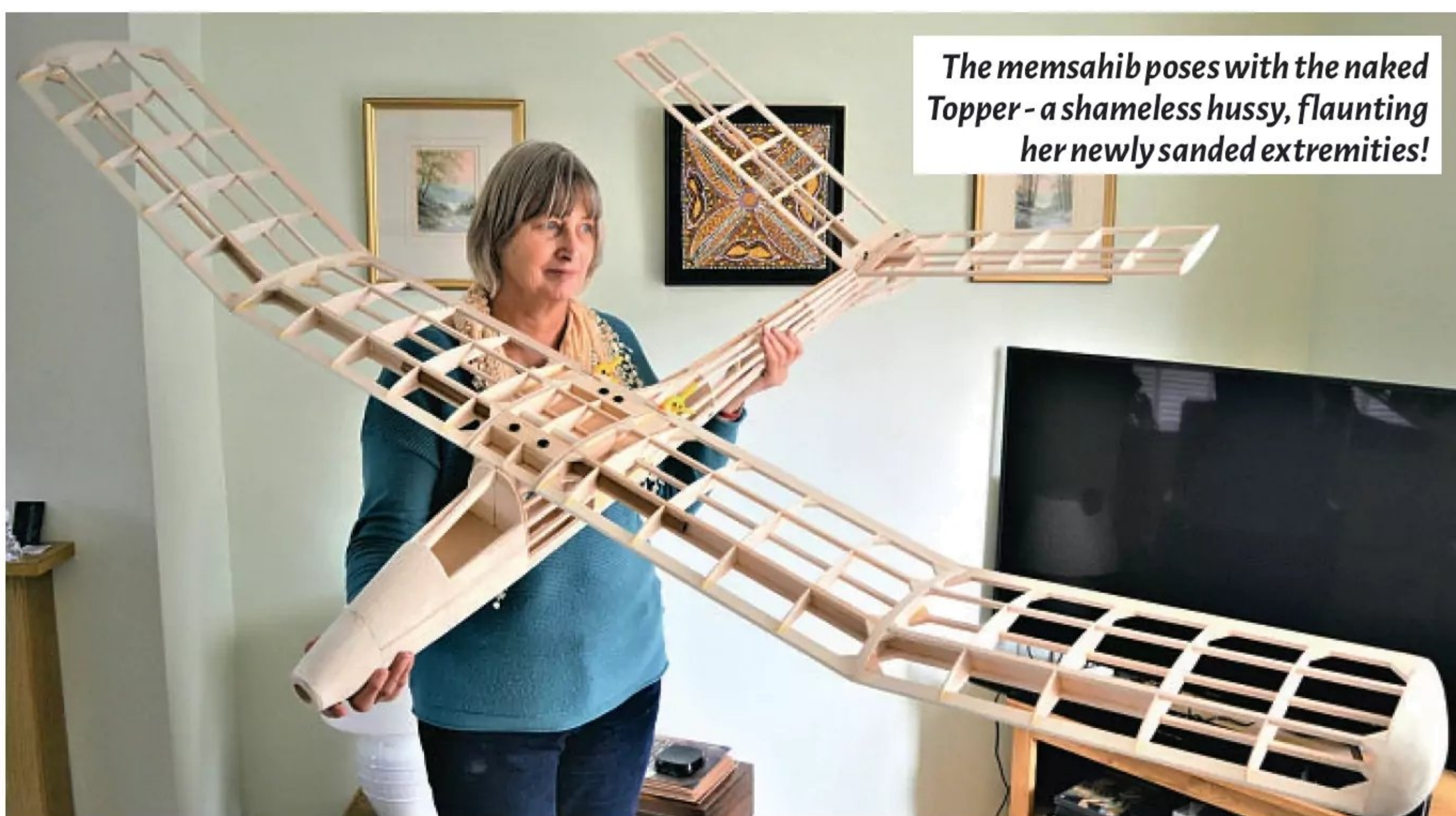
DOUBLE DISASTER

This time **Dave Goodenough** has a whoopsie with his two-times KK Topper, converts his building board for building dihedral into a one-piece wing and bags some bargain tools

Words & photos: **Dave Goodenough**

Being 'of an age' I have a certain affinity with models of my vintage, one being the 1948 Keil Kraft 'Topper' designed by Albert Hatfull, of very distinctive fuselage shape and huge vee tail. I'd enlarged the plan to twice-size, a manageable two metres (80 inches), with an inrunner motor grafted into the nose to preserve the 'look' of the original 40-inch glider and using my well proven 'twisteron' wing control.

After setting up at my club patch one of the lads heaved the Topper away and off the big beauty went, slow, stately and like a galleon in full sail. The big 5000 mAh LiPo used to finalise balance meant long flight times under power and only boredom brought about an eventual landing, culminating in a long slither along the damp grass runway. After a bit of a chat session I changed the battery and had another



The memsahib poses with the naked Topper - a shameless hussy, flaunting her newly sanded extremities!



'Get up there!' The inrunner motor hauls the winsome beauty heavenward. A super flying model that I must repair and put back where it belongs.

"...the model was eventually found buried in a patch of stinging nettles - after smiting the only fence within 50 metres upon its arrival!"

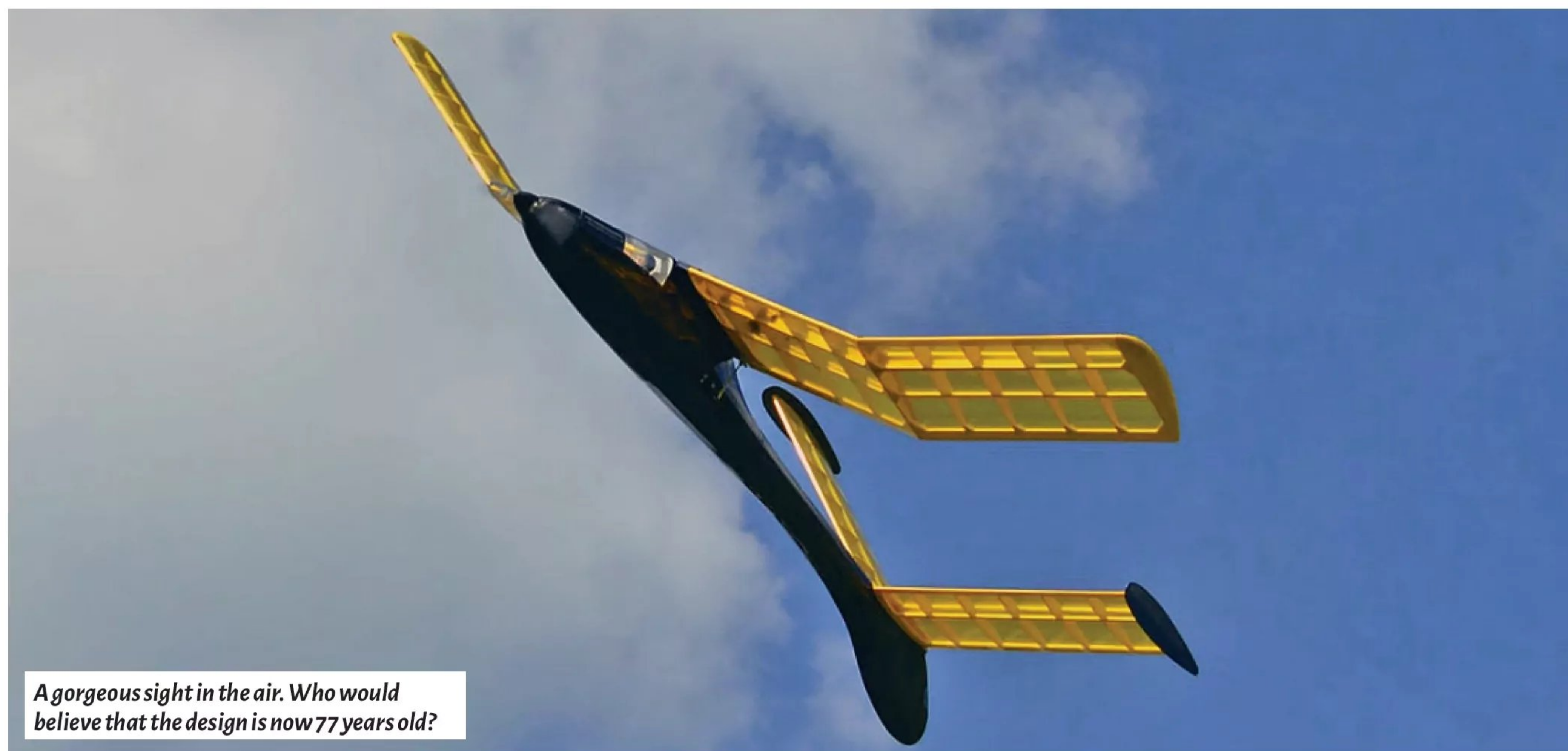
Joined by my mates, the model was eventually found buried in a thick patch of stinging nettles - after smiting the only fence rail within 50 metres upon its arrival! Despite the mess it looks easy to repair when I have plenty of time to spare.

mate heave the old girl back into her preferred element. Press repeat on the first flight and all was well with the world.

Some ten minutes later and upwind at distance the Topper was gently banked left for a return pass but then refused to answer the transmitter. Fingers flailed on the sticks, blood pressure medication was severely tested and the involuntary clench of ones *Gluteus Maximus* tested unda-dunga stitching! Topper tilted left, stuck in its pre-commanded bank and, with no response to my inputs, transitioned slowly from left turn into a spiral dive. Those final 300 feet and the horrific inevitability of the splintering arrival will be etched in the Mk.1 organic software for a long time. The 'WHACK!' as it returned to earth was heard clearly, downwind and a quarter mile away. Time for the 'walk of shame'!



That'll polish out! The rather 'modified' Topper x 2 after its electrical catastrophe, uncontrolled dive and fence collision.



A gorgeous sight in the air. Who would believe that the design is now 77 years old?



The cause of my KK 'Topper' x 2 crash. A sudden internal short and blowout through the motor end cap. Note the solder spatter and burn deposition.

POSTMORTEM

So why did the Topper's control suddenly fail so completely?

When I took the canopy off to unplug the LiPo the stench of electrical 'frying' was impossible to ignore but the ESC looked intact, with no melting or scorching. However, the motor was stiff to turn. It was not damaged in the crash as it was the right wing that took most of the impact.

Removal and dismantling showed failure of the motor windings and a blow-out, as the scorched insulation and solder spatter indicated. It's a very rare phenomenon indeed, the internal electrical 'short' having instantly overloaded the ESC, ending its existence and the supply of volts to the receiver in the same moment.

No power = no control = QED: no model.

It was one of those sadly unpredictable and random failures that plague us from time to time.

In answer to all you armchair 'fonts of wisdom' the motor, ESC and battery were all



I found this image online and it fascinated me enough to begin the drawing and build process. When finally finished I hope the model flies better than the original glider! Image courtesy of 'Powerhouse Collection. Purchased 1934'.

well within normal parameters, as was the prop size. The model had made dozens of flights over the last few years, all without incident.

MILLER'S MOD

A new scale model of the Pelton 'Bat' I'd drawn and begun to cut parts for posed a challenge. As a flying wing it has a flat top surface to the wing, is a wide delta shape with a straight trailing edge and no dihedral. Despite that the ribs thin from root to tip on the underside; this effectively give a nod towards dihedral and the swept back leading edge also gives a modicum of dihedral stability, if my shaky grasp of aerodynamic theory holds true. 'Ten degrees of sweepback equals one degree of dihedral' is the calculation.

But how to build the one-piece wing? I could try to construct it inverted, as that would maintain the dihedral-less wing top shape. But faffing with such a non-standard build would bend my head. So, what to do?

A previous conversation with the late model design maestro, Peter Miller, provided

the answer - a hinged building board! My existing board was an offcut of 18 mm plywood and becoming rather scarred and lumpy a replacement was due. But it could perform at least one more service. Cut in half, I used a cheap 40 mm (20 mm folded) piano hinge to enable jacking up the two leaves to the correct angle and allow the wing to be constructed in one piece. Any awkwardness at the board hinge line due to the centre rib, sheeting, etc. could be fudged and remain unseen/disguised where the wing attached to the stubby 'coffin' fuselage. With correctly sized spacer blocks under each leaf of the board it was simplicity itself to attach the plan and begin thinking about pinning spars and ribs.

It takes little imagination to see that the hinged board can be used on virtually any other wing (the Cosmic Cloud, last issue's Pro-Plan, is shown) or inverted to allow simple assembly of models with cranked wings, the vintage Spook being just one.

Late update: I had cut all the ribs for the 'Bat' and began to pin all the bits out - and found



It's as rough as a Bear's chuff but my old building board serves one last duty. Hinged in the middle it allows dihedral to be built-in direct on the board.



My cheapo new airbrush set. The white box is the neat and adequate compressor and the small unit within the flexible hose loop is the moisture trap.



Bought many years ago as a 'job lot' these mixed springs still provide the occasional 'just right' part.



All you need to form your own hook and loop ends, then attach them. The coated wire and crimp ferrules are cheap fishing equipment.

that 24 of the 25 ribs were the wrong profile. A real Homer Simpson 'Doh!' moment. Back to the drawing board!

BEGINNERS BUNDLE

If you eyeball 'the usual suspects' at any average club flying field you'll find that a great many, possibly most, models are film covered or made of various foams, either bare or painted. What do you do if you feel the need to paint such a model or part thereof? Reach for the paintbrush, grab the nearest pot of paint and slosh it on, or buy 'rattle cans' of solvent based colour?

For many foam models spraying from a can will result in the model dissolving before your eyes, not quite the spread of colour you'd originally intended. The 'safest' paint in most cases is water-based acrylic, which is easy to find, cheap and relatively light, especially if applied with an airbrush.

Although late to the party in buying an airbrush I couldn't justify the cost of a 'quality' device and proper compressor unit. I've managed without for decades and for the minimal projected use of such a tool I decided to go cheap again - not always the best option but then I have deep pockets and short arms!

Found on that popular auction website was a complete airbrush and compact compressor set



Moustique lower rigging attachment. Steel fishing trace, crimps, spare spring, brass closed loop end fitting and a handmade hook/loop - simples!

at a very low price. Surely it couldn't be much for the asking price of just over £30. Cheapskate that I am, I had to risk it and bought the kit 'on spec'. Only testing would prove if I'd wasted my pension pittance.

Opening the package and assembling the goodies within, I was pleasantly surprised. I'd expected rubbish but received something that looked most definitely workmanlike. Rapid assembly of the set and a power up showed that it all worked, then a run through of thinned acrylic paint 'proved' the system.

I'll be playing with it some more soon and will report on my success, or otherwise, here in the future.

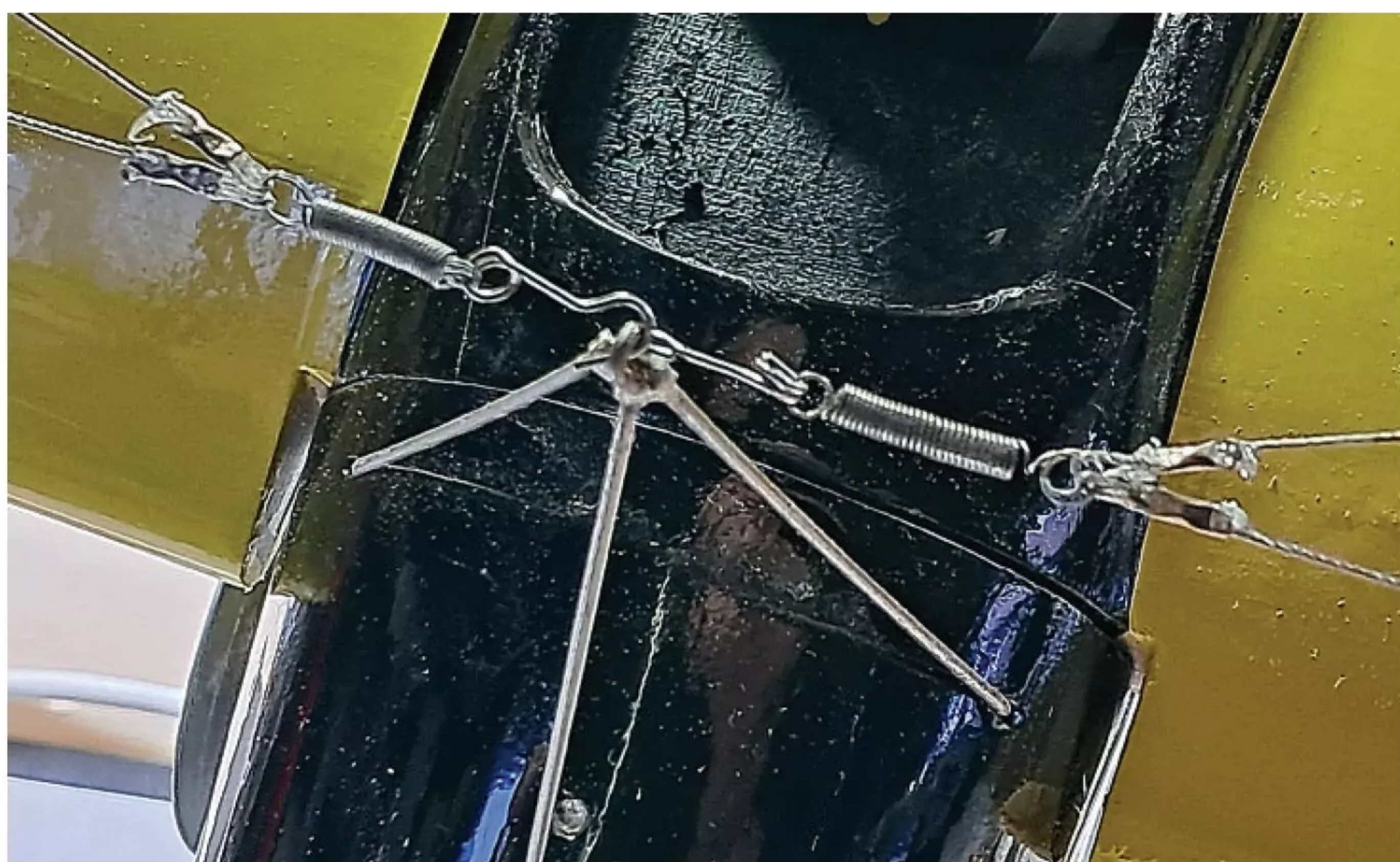
FARMAN FIDDLING

A previous and relatively simple scale model that I built a few years ago is the Farman Moustique, different from most these days as it sports a glow engine. Yes, I still practice the dark arts of IC engine fettling.

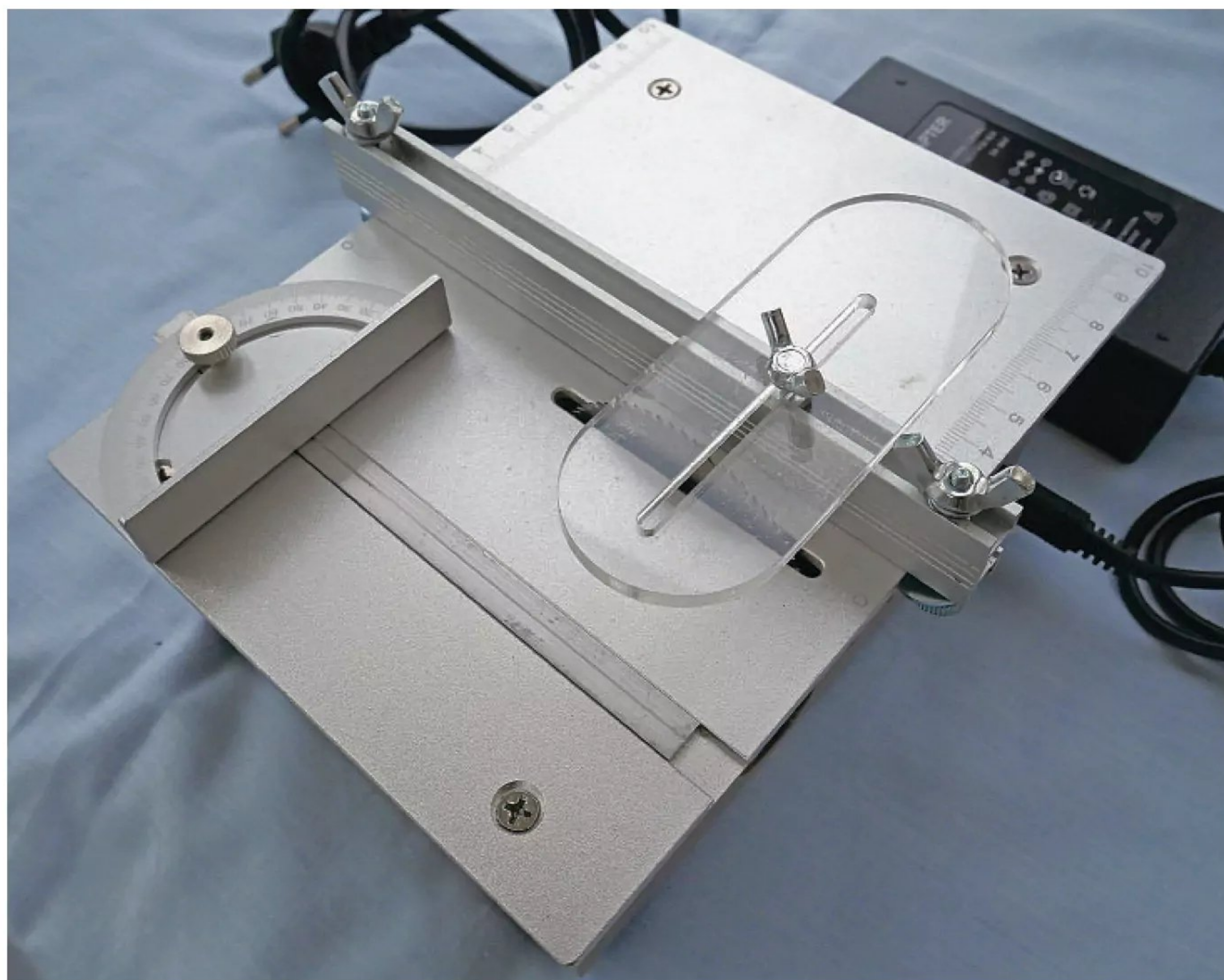
The model has, because I chose to emulate the original aircraft, wing bracing wires. Previously I had used grey shirring elastic, a fine cotton-covered rubber strip found in dressmaking shops, to act as non-load bearing 'wires' and they looked okay for the job. But I discovered a drawback. Over time the elastic has weakened and slackened, probably due to rubber degradation. So, what to do?

In a previous article I'd shown the use of coated stainless steel fishing trace wire as a closed loop control method. So why not use the same thing as the wing bracing wires on my Moustique, as the wires will never slacken with age.

Many years ago I bought a packet of small loose springs of various shapes and sizes, and I still delve into the pack to find a 'that'll be useful' spring from time to time. To attach the Moustique flying wires to their anchor points I made some hooks with attachment loops, easily done with 0.5 mm piano wire and small round-nose pliers. Between the hooks and the flying wire loop ends I used small tension springs to allow ease of attachment and removal, plus they would give some tautness to the flying wires. The nearby photos show how. I know they are not 'scale' but they look sufficiently scale-like, using springs instead of scale turnbuckles. ✈



More Moustique rigging. Not the tidiest job I'll admit but this codge-up of bits gives a scale-like look to this semi-scale model.



My low cost, bench top circular saw. For just a smidge over £30 I'm not going to complain. If you buy one be prepared to fettle it a bit and all should be well.

A SAW POINT

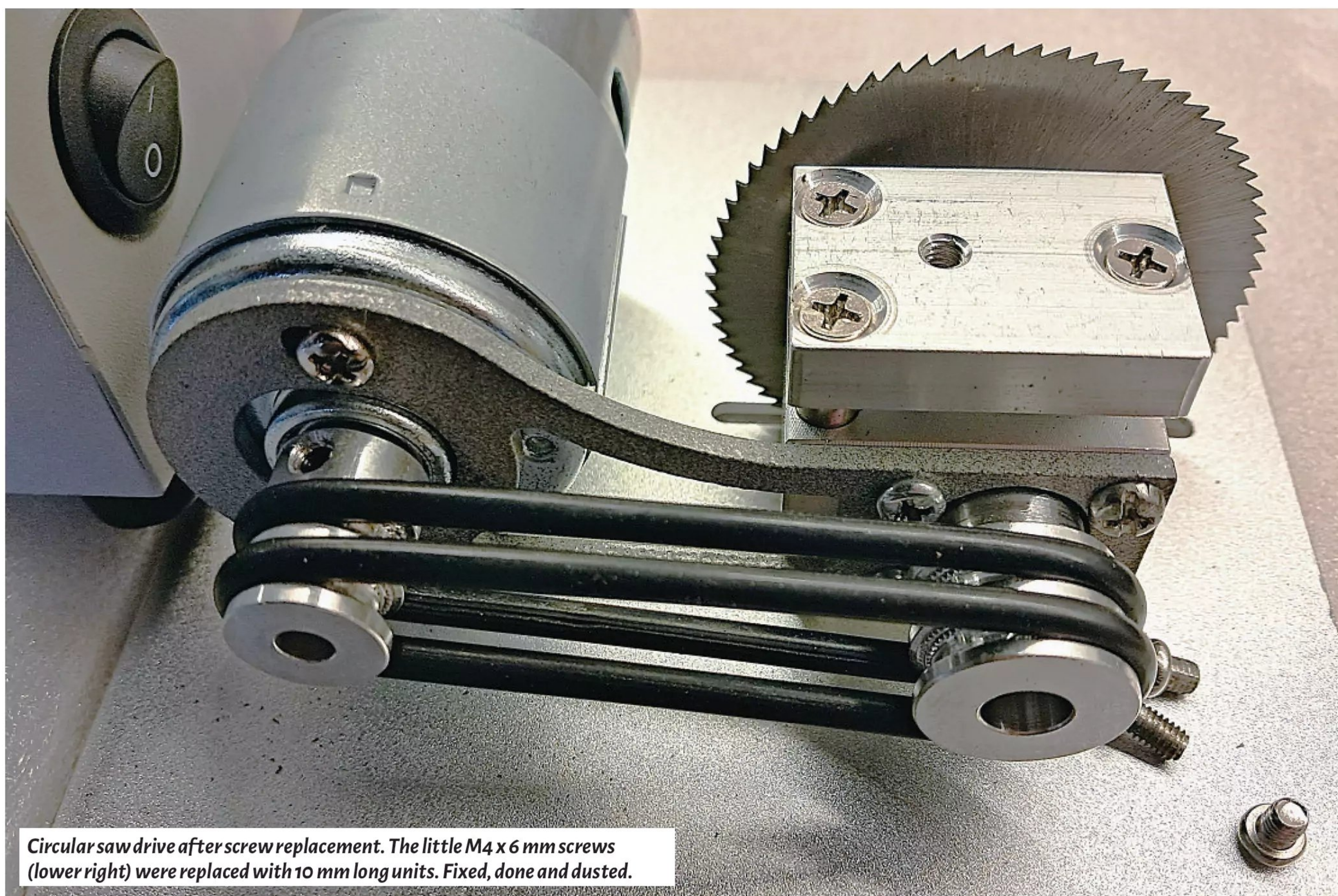
Whether it's age or just my wonky hand/eye coordination, when cutting straight strips by using a steel rule and craft knife, I often manage

to be left with a cut 'out of true'. The knife blade had obviously leaned a bit, leaving me with either a naff and scrap piece of wood or a sanding job to do, all wasting expensive balsa.

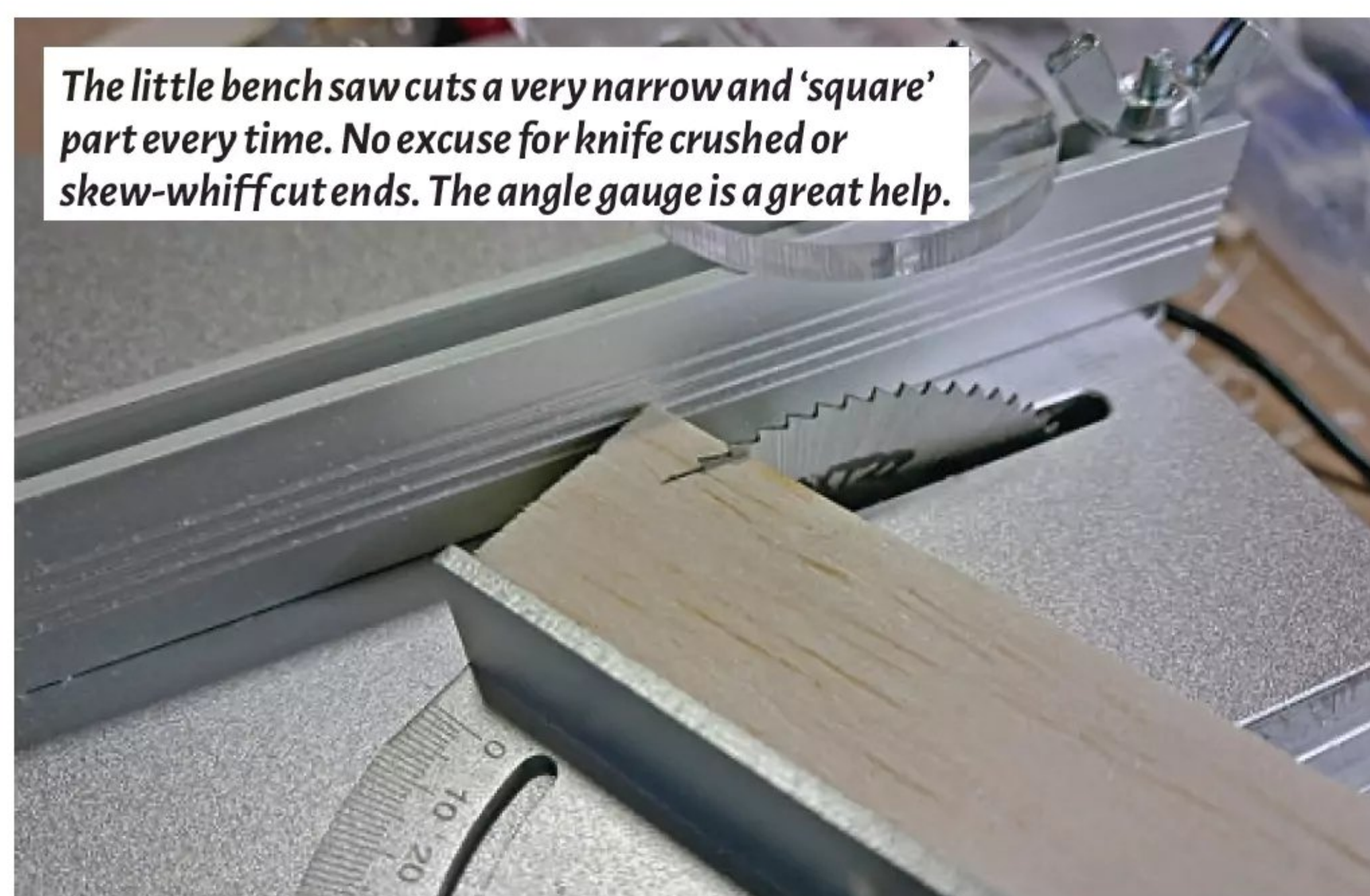
"The thin and fine cut sawblade appears to have no kerf (offset of the teeth) so care must be taken to keep the workpiece straight"

Whilst blundering around the internet I came across a little bench top circular saw. A tiddly thing, but just right for cutting thicker sections of strip wood or ply that would be too much for a normal balsa stripper. Finding the cheapest one available, I assembled it quickly, plugged it in, switched on and... heard a horrible grating noise before it stopped! No way was I going to send the thing back, so I removed the table to find the motor hanging loose. The 6 mm long motor support arm attachment screws were all too short and simply fell out. This was obviously a 'second', sold cheaply for clearance. A rummage in the M4 screw drawer found replacements the right length at 10 mm and I reassembled the device.

It's true that the quality of the saw and angle guides is pretty iffy, but those are



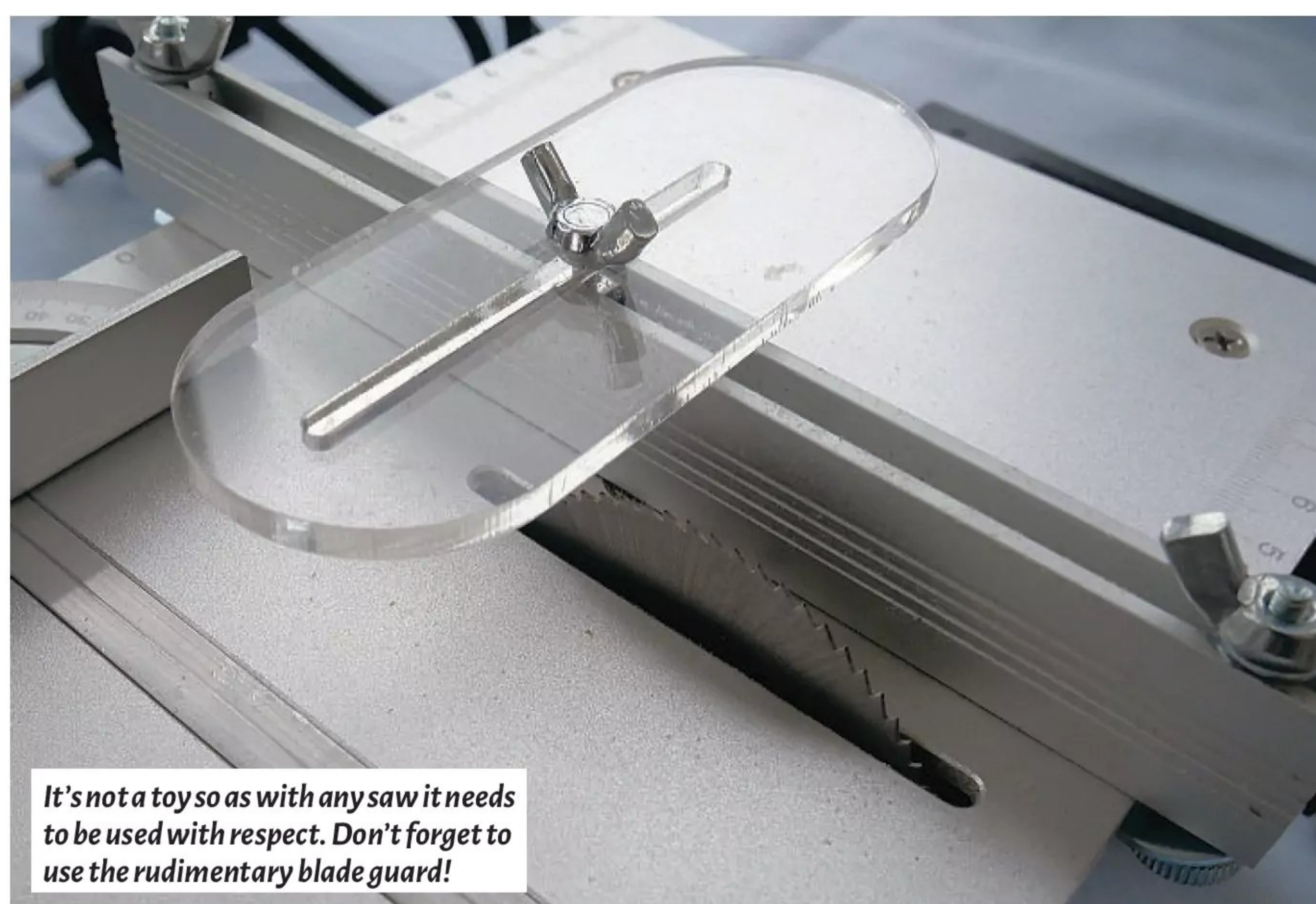
Circular saw drive after screw replacement. The little M4 x 6 mm screws (lower right) were replaced with 10 mm long units. Fixed, done and dusted.



The little bench saw cuts a very narrow and 'square' part every time. No excuse for knife crushed or skew-whiff cut ends. The angle gauge is a great help.



It's all you need for cutting those dead square ends and strips.



It's not a toy so as with any saw it needs to be used with respect. Don't forget to use the rudimentary blade guard!

simple to adapt. The very thin and fine cut sawblade appears to have no kerf (offset of the teeth) so care must be taken to keep the workpiece straight or it will act as a brake on the blade disc. Taken steadily the saw will give a very fine cut that is absolutely square, only needing a light sanding to remove any 'hairiness' from the cut edges. The tool is cheap and cheerful, a tad poor on quality, but does the job very well if you take things steadily. I found mine for less than £30, including delivery.

One last thought. This is a proper circular saw and care must be taken when using it. A spinning cutter does not respect finger flesh!

PALTRY PACKAGE

Whilst out with the memsahib and acting as her shopping taxi service yet again, I cast my eyes across the 'middle of L**I' goodies on display. Yet another little pack of wonder was stacked before me, an assortment of diamond files and 'picks', curved and pointed implements used to ease and prise O-rings and similar from their resting places. Also within were long double-ended screw and 'Torx' driver tips, plus an extendable magnet tipped 'wand' for small part retrieval, with everything made to clip safe and secure into the contained handle.

I couldn't pass the kit by and snuck it into her trolley. A penny under six quid well spent, methinks. I think the pension can stand it!

TAILSKID

As my old engineering foreman once told me, 'There's always another way of doing a job. You just have to find it—or invent it!'

So it is with building model aircraft. Don't 'flog a dead horse' if a certain build method doesn't work for you. Find another way of sorting the conundrum. After all, 'We don't have problems, just challenges to overcome!'

If you've had one of those super flying sessions where everything went just so, but there was no-one else about to share in your sense of accomplishment then remember what Thomas Hardy once quoth, 'The mightiest moments pass uncalendared.' You'll remember the perfect flights. Let that be enough.



Found in that 'middle aisle', a very handy kit of diamond files, picks and long screw and Torx driver tips, including an extendable magnet for retrieving those dropped screws!

Send me an email: coetquidan@yahoo.com ■

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A high wing semi-scale monoplane fitted with large wheels can make a good R/C trainer.



IN THE BEGINNING

Gerry Edgar attempts to demystify some of the jargon and terminology commonly used in our hobby for anyone who is a recent convert to the wonderful world of R/C model flying

Words: **Gerry Edgar**

Photos: **Gerry Edgar**, RCM&E archive

What is a radio-controlled model aircraft?

A model aircraft can be a rotorcraft or an aeroplane. A jet aeroplane is probably the most familiar mode of transport to your holiday destination. Helicopters are another familiar sight in the sky and are widely used by the police, military and general aviation. Other aircraft in our skies are light aircraft, military jets and private jets. All these can be scaled down to an appropriate size and with some alterations to wings and controls, or rotors, they can be given a radio control system, an engine of some sorts and made to fly. These are scale models. You may have heard the term 'Warbird'. This is a scale model of a military aircraft.

Then there are models specifically designed as model aircraft. These can be classed as:

Trainer - which does what it says on the tin!
Sport - capable of most basic aerobatics.



Even better, use a high wing trainer designed for the job, such as the Ambisagrus which was the pull-out Pro-Plan in the March issue of RCM&E.



Scale models are scaled down versions of full-size aircraft.



A typical low wing sports model.



A lovely scale helicopter lifts off.

Aerobatic - fully capable of all manoeuvres that a full-size aircraft can do.

Fun Fly - also capable of all manoeuvres and 3D flying.

3D describes extreme manoeuvres such as prop hanging, a rolling hover with the rudder virtually touching the ground, knife-edge spins or very low knife-edge. Knife edge is where a model is flown on its side.

Don't panic. These are just some of the terms used for model aircraft which have wings (also known as fixed wing) and which are powered by propellers and jets (gas turbines) or electric ducted fans (EDF). Some models overlap the above classes.

There are also radio-controlled gliders, available in a wide range of sport and scale types.

Aeroplanes are generally not capable of vertical take-off.

HELICOPTERS

Model helicopters and their full-size counterparts are a different ball game all together. Highly manoeuvrable, they have one or two sets of rotors and probably a tail rotor. Helicopters are capable of vertical take-off and hovering. There are lots of scale model helicopters but many are unique designs made for the hobby. Many people find helicopters are harder to learn to fly than a fixed wing aeroplane.

There are also autogyros, which are similar to helicopters, but they cannot perform a vertical take-off because the main rotor is not driven.





Small quadcopters can literally fly by themselves thanks to modern electronics and automatic stabilisation systems.

MULTIROTORS

A quadcopter or multicopter relies on rotating blades or airscrews to fly. They are incredibly aerobatic. There are some very large full-size multi rotors.

Many quadcopters are very small aircraft. Often referred to as drones these are usually fitted with electronic aids which make them very easy to fly. You may have heard of using GPS to track a flight. Such aircraft may have a Return To Home (RTH) function, a loiter mode, as well as automatic take-off and landing. They are equipped with gyros and automatic stabilisation. There is also the flight controller, without which a multicopter could not fly. Some systems have First Person View (FPV) to give you an in-cockpit view.

These days all these features can be fitted to a greater or lesser degree to all types of model aircraft, not just multicopters.

WHY LEARN TO FLY?

So why do you need to learn to fly when you can simply press some buttons to make something fly? Basically, we are talking about a sport that requires a skill to master. Also, you will be in charge of a guided aircraft. Some of these models are fast and heavy and have a lot of kinetic energy. They can do a lot of damage if misused and they are definitely NOT toys.

But what happens if the bells and whistles stop working. A quadcopter will literally fall out of the sky. Bummer! A helicopter may be a bit more controllable if some of the electronics fail but it will probably end badly. A model aeroplane or autogyro will glide, even if the motor stops. But you will still have to land it.

Any fool can fly but it takes an expert to land (according to an old pilots' saying). This is why we learn to fly, preferably without electronic aids. If you want to learn to fly, then you have to develop skills. You will also need to register with the Civil Aviation Authority before flying most drones or model aircraft outdoors in the UK.

Are you still interested? If so, a good first step is to read about the CAA's registration requirements here: <https://register-drones.caa.co.uk>

ASSOCIATIONS & CLUBS

Joining the British Model Flying Association or Scottish Aeromodellers Association will include insurance, unless you are a commercial operator. Model flying insurance is also available from other organisations and providers.

Your first move as a beginner pilot should be to join or approach a club. A club may let you have some trial lessons, usually prior to joining. They will use an appropriate trainer and probably a dual control system. This is sometimes called a buddy box or lead. There are also wirelessly linked transmitters. This way you can see if the hobby is right for you.

Learning by yourself, even with the help of gyros and stabilisation, is a recipe for disaster for most people. Multicopters are very easy to fly in their basic modes, but you may not have access to a suitably safe environment. Helicopters are often thought to be more difficult to fly and people tend to move onto them after flying and mastering fixed wing aeroplanes. Helicopters, in general, need better hand to eye co-ordination and any slight

mistake with a heli often results in broken blades and parts - and hearts!

Model clubs and associations are a great source of information and advice. Clubs will advise you on which radio transmitters are favoured locally and which models are good for training. Associations offer advice on the legal side of things and safe flying, as well as how to get your basic qualifications.

You will find you progress quicker in a club environment. Training is generally free and there will always be someone present if you need support. Clubs are also a great way to pick up good second-hand gear, reducing the expense of setting you up in the hobby. Some members may be able to offer used, basic gear that is still good quality as people move on from their trainers and upgrade their transmitters

EVERYONE IS DIFFERENT

Learning to fly any aircraft requires commitment, concentration and a gritty determination. How hard is it to learn? Well, everyone's different.

Personally, it took me ages. I learned without a buddy system and every time I went flying, I broke something. That was in the bad old days when you had to build your own trainer from a basic kit. I started in around 1992 and only got my Scottish Aeromodellers Association bronze in 2013.

I have some full-size flying experience in General Aviation and held a private pilot's licence PPL A (fixed wing aeroplane). I would say that flying a model aeroplane is harder in some respects. I knew what to do but I couldn't do it. I hadn't developed the muscle memory or the co-ordination. I found judging speed and orientation difficult.

What helped me? I got an R/C simulator for my PC and merrily crashed aeroplanes left right and centre. It also helped when I changed from two stroke IC engines (glow engines, also available as four strokes) to an electric set up. My model flying came on leaps and bounds. I would say now that I am an intermediate flyer. But I still have some super crashes!



Model pilots with full size training often enjoy building an R/C replica of the aircraft they trained on, such as this Piper Tomahawk.



The ideal trainer should be as big as you can fit in your car and be fitted with a robust undercarriage with wheels as big as is practical.



Biplanes like this Tiger Moth are well known as full size training aircraft but are probably best saved as a third or fourth R/C model.

YOUR FIRST MODEL AEROPLANE

I am not an authority on quadcopters or helicopters, but I do know about fixed wing aircraft. Have a look on any model shop website and there will be a confusing array of models, some of them reasonably priced, others costing up to thousands of pounds. And some of the terminology is confusing...

What is ARTF (Almost Ready to Fly), RTF (Ready to Fly), RTB (Ready to Build). There are kits to build, whilst others just plug together and fly (PNP, Plug N Play). But some websites are very good and many will have a good selection of trainer fixed wing models.

The ideal trainer should be as big as you can fit in your car, typically around 4ft 6in or just under 1400 mm wingspan. I would not go much below a wingspan of 39 inches (one metre). It should have a robust undercarriage with wheels as big as is practical. I use five-inch (around 120 mm) bush plane wheels. Larger models fly better because of their weight and you will not lose sight of them so easily. Their larger mass also makes them more stable. A bigger model is more capable of allowing you to complete your basic qualifications, such as the SAA Bronze or BMFA 'A' schedule.

You can fit your trainer with all the electronics you feel you need but ultimately you will have to fly without these aids. When you are learning to fly you won't start on a high-performance aeroplane. You will progress as if you were learning to fly a real one, such as learning the basics on a Cessna 172, a Piper Warrior or a Piper Tomahawk, before moving onto a more powerful plane.

Most light general aviation aeroplanes have a tricycle undercarriage, with one wheel at the front and two at the back. The other configuration is a tail dragger, which has two large wheels at the front and a smaller one at the tail, such as a Piper Cub or Tiger Moth. With full size aircraft this requires a different take-off and landing technique, requiring very good control of the rudder.

A lot of model aircraft are tail draggers and they handle well. But some warbirds can be difficult, so these are best avoided until you gain some experience.

WARBIRD OR JET? NOT YET!

The next thing is where the wing sits on the model. An aircraft with one set of wings is

called a monoplane; two wings, one above the other, is a biplane, while three wings above one another is a triplane. The best R/C trainers are high winged monoplanes because their Centre of Gravity is lower.

Do not buy a warbird, a jet or any other high-performance model to learn to fly with. A lot of people fall into the trap of buying a too advanced model before developing the skills to handle them: "I would love a Spitfire or a Mustang, or maybe a 3D model..."

Steer clear of these. Scale models have scale problems and, usually, small wheels. If it was difficult to fly when it was a full size the model is likely to have the same problems. Some 3D models (highly aerobatic) can be toned down so that an intermediate flyer can handle them. Other models to steer clear of when you are learning to fly are complex types with flaps and retractable landing gear.

BUILD OR BUY

For me, building a trainer in the 1990s was a learning experience and most of the engines back then were two stroke glows. The wings were cut from foam with obechi veneer skins. With fibre glass tape covering the central join these were remarkably strong and could take a heavy knock. The fuselage (the body

of the plane) was made of balsa and ply, a construction method that is still widely used. But these days you can build with just about any light plastic, foamboard, Depron or Correx.

Foam ARTF models have revolutionised the hobby, allowing you to fly more and repair less. And there is a good choice of trainers made from foam.

Building is not cheap as balsa is expensive, as are covering materials and glues. Also, building a model takes a lot of time and effort (but does give immense satisfaction). After all this, if you make a mistake your balsa pride and joy can be totalled in an afternoon! So, I would go for some kind of foam trainer, or at least a model with a foam wing.

LITTLE ONES

There are a lot of sub 250 g model planes on the market, many fitted with gyros and stabilisation. Why not use one of them to train on? They cost less than £100, come with a controller and are ready to fly 'out of the box'.

Such models are fun to fling in the back of the car and take on holiday. You can fly them almost anywhere with a large enough open space and if byelaws allow. However, they are very small and are almost impossible to fly ✈

The Supermarine Spitfire is the classic 'I want one!' model for newcomers to R/C model flying. But save it, and other warbirds, for when you have learnt to fly.

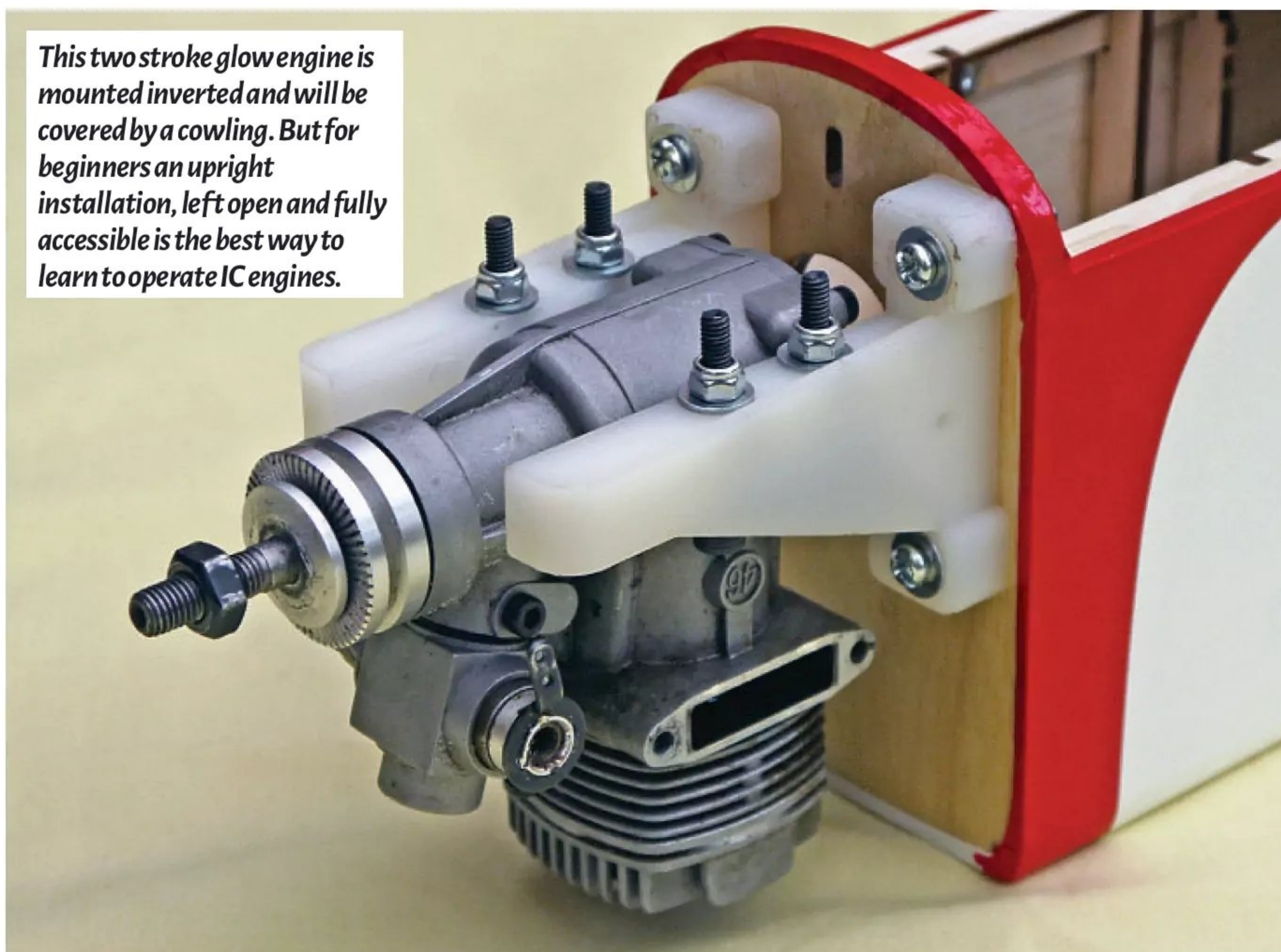




Small sub-250 g models like this P-51 Mustang are widely available and thanks to modern stabilisation systems they can be flown by novices without any help. But they are really not the best way to start and the DIY approach may teach you bad habits.



Controllers that come with small Ready To Fly aircraft are very basic and are likely to not be usable with follow on models.



This two stroke glow engine is mounted inverted and will be covered by a cowling. But for beginners an upright installation, left open and fully accessible is the best way to learn to operate IC engines.



without gyro assistance. A 16-inch (406 mm) wingspan model becomes hard to orientate, even at a short distance, and they fast become a silhouette. The low weight of the model makes it twitchy. Also, the gyro will fight against your manoeuvres and the transmitter supplied with one of these little models is very basic and you cannot make big adjustments. You will most likely soon grow out of it.

INTERNAL COMBUSTION OR ELECTRIC

I did most of my learning on high wing monoplanes fitted with tricycle undercarriages. Two stroke glow engines were the preferred power unit. My models had big wheels which absorbed many hard landings. I had Precedent High Boy and D.B. Mascot trainers. I flew both into oblivion!

I also had a very reliable MDS two stroke engine and had so many crashes that I broke the silencer. I had to bodge up something to keep it running!

Internal combustion engines have been around for decades. A two stroke relies on a mixture of methanol, often some



A typical brushless electric motor installation. This one is fitted on stand-offs to fit at the front of a scale model's cowling.



To operate a glow engine, you will need some starting equipment, some of which is shown here. A starter motor allows you to spin the engine over whilst keeping fingers away from the propeller. The power panel, connected to a small 12V battery, provides a dropped down voltage to the glow lead, which is clipped on to the glow plug screwed into the engine's cylinder head. This provides ignition and is removed when the engine starts and is running well. This power panel also has an internal fuel pump to transfer fuel from a storage bottle to the fuel tank inside the model.



Ammo boxes are a good way of storing LiPo battery packs.



The author's battery charging station.

nitromethane, and some oil. Synthetic oils are used now, replacing castor oil.

At the more advanced end of the spectrum, we now have four strokes, petrol engines, jet turbines, turbo props and pulse jets. There are even large radial engines; these can cost thousands of pounds and are meant for bigger models.

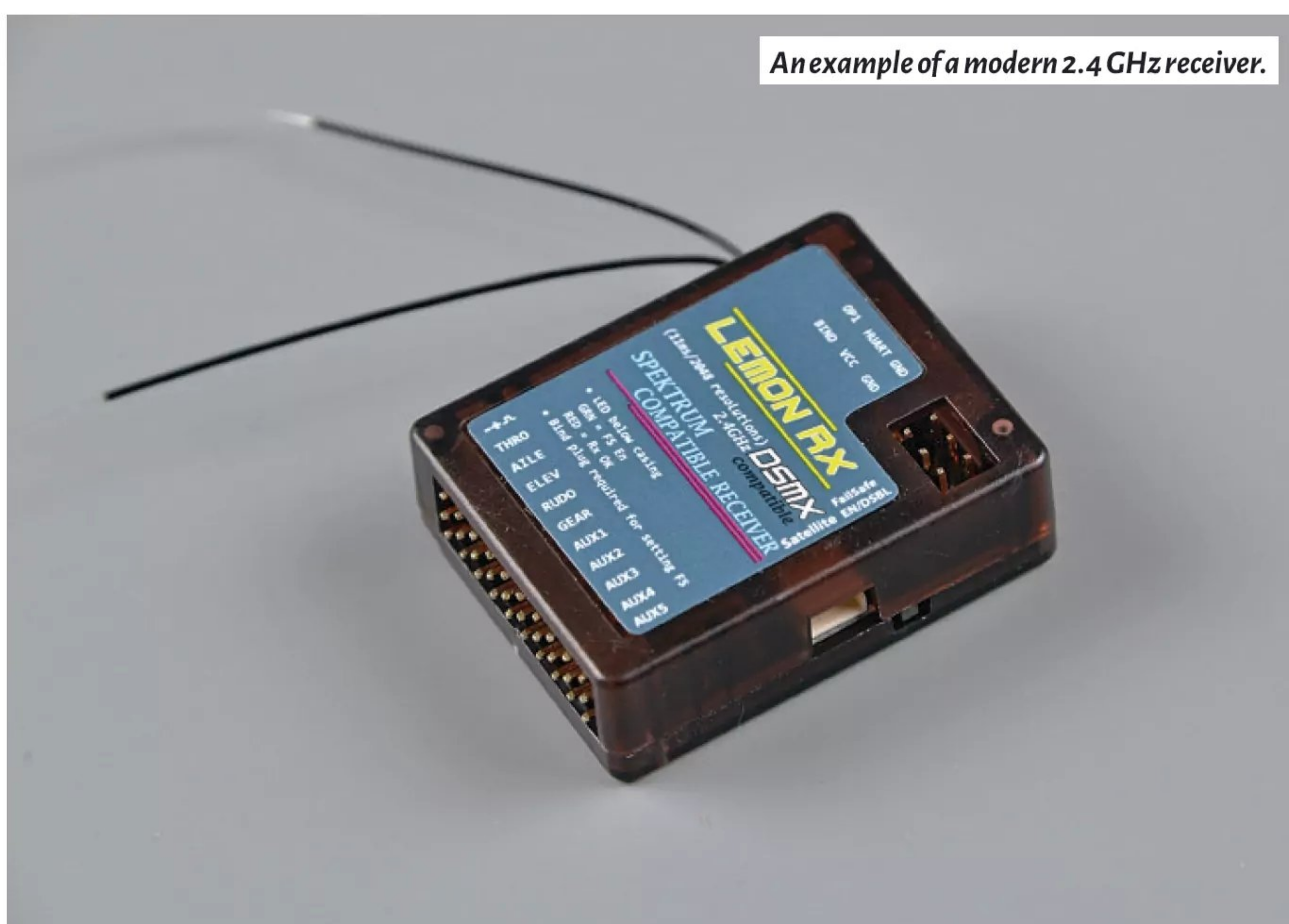
To run an IC engine you will need a starter box. In it, typically, will be a 12-volt battery, a power panel, an engine starter, a fuel pump, a glow connector and a fuel container, as well as a fuel delivery system. If you're an engineer and know about engines and can troubleshoot them then that's great. But they can be temperamental and they have to be run on the right grade of fuel. However, you can get longer flights with IC engines than when using electric power and they are often the default choice for use in larger models.

Alternatively, electric flight is quiet and clean. But batteries (usually Lithium Polymer, LiPo) have specific hazards and must be charged using the correct chargers. They will wear out and eventually they must be replaced. Having said that, I have had batteries last for several seasons because I charge at a low rate using a top-quality charger. When flying an electric model you don't need a starter box but will need something to carry your batteries in. I find old ammo boxes are ideal.

One thing I can say about electric power is that it improved my flying. So, what I would do now would be to learn to fly using an electric powered model and then dabble in IC when I had gained some experience. Electric power is so reliable. What you have is a motor and speed controller. It can be a brushed or brushless motor, often the latter these days. Bigger motors require bigger batteries and high-power speed controllers. Setting up for electric



Take the time to read up on how to get the best use from your transmitters. These two Futaba trannies, used by the author, are subtly different.



An example of a modern 2.4 GHz receiver.

can be expensive and matching propellers, motors and speed controllers is a bit of an art. You will also benefit from having a power meter and a battery checker.

TRANSMITTERS & RECEIVERS

You will need a receiver (Rx) for your model, unless it is already fitted in the plane, and a transmitter (Tx). These are a major outlay and you get what you pay for. Buy a good transmitter and it should last for a long time. Don't be afraid of second-hand gear, but I wouldn't buy online as there is usually gear available at your local club which you can see and possibly try before buying. There are lots of old radio sets out there and it's best to stick to a brand favoured by other pilots in your club. Steer away from the bottom of the range ones and get an up-to-date, mid-range transmitter.

There are also now open-source software driven transmitters (typically OpenTX and

EdgeTX). Ask around and you may pick up a deal.

Do get to know your transmitter because they are all slightly different in how you set them up, even from the same manufacturer. I have two Futaba transmitters and they are both subtly different. You will find online guides to setting them up and even Kindle books.

Receivers are very reliable these days, mostly using 2.4 GHz. They must be matched and bound to the transmitter. This means that receiver will only work with that transmitter and generally, when it is bound you cannot select the wrong model on the transmitter. If you have a crash or rebuild, always check that your receiver is working okay before using it again.

So, that covers some of the basics. I hope it has been useful to those of you without any experience or knowledge of radio-controlled model flying. Do join us and give it a go. You will have a lot of fun.

Welcome to the hobby! ■

The author with his Duraflly Ugkly Stick.



The author's RadioMaster TX12 Mk. II.

EDGE TX

“Anything you are used to on a Spektrum or Futaba radio can be found here as well.”

Kevin Scott provides an introduction to the Edge TX operating system now commonly used in R/C transmitters

Words & Photos: **Kevin Scott**

Welcome to the second article on ELRS and EdgeTX technology. The topic we are going to cover this time is the EdgeTX operating system. This system is used and continues to be developed on radios from FlySky, Jumper and Radiomaster. As these radios come in a variety of screen sizes and have screens that are either monochrome or colour and also have a varying number of channels the operating system has to cope with quite a few variations.

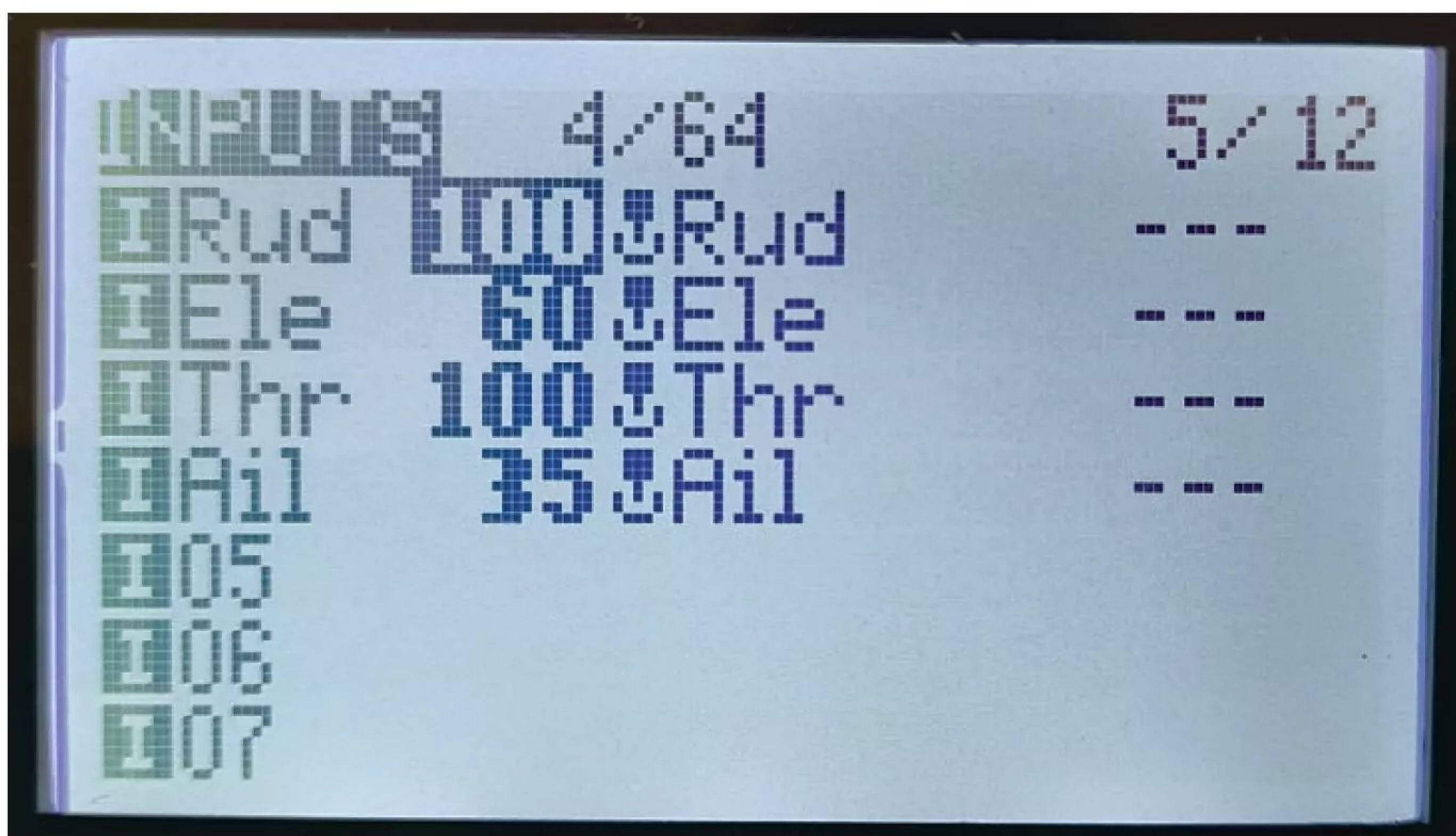
I myself have the Radiomaster TX12 Mk. II which you can see in the nearby image (it also featured in the previous ELRS article). This transmitter (Tx) comes with 12 input channels and outputs on 16 channels. It has hall effect gimbals, so no wear over time, has haptic feedback (it vibrates when there is something to worry about!) and voice feedback. It has a 128 x 64 monochrome display and retails for £99 at the time of writing from hobbyrc in the UK.

The TX12 Mk. II is typical of these types of transmitters in that you can buy it with either an ELRS RF module inside or a CC2500 LBT RF module. They all (unless they are a very small unit) have a JR module bay on the back so that a second RF module can be fitted.

THE STANDARD STUFF

Anything you are used to on a Spektrum or Futaba radio can be found here as well. All the usual suspects such as selecting a model, assigning channels, setting trim gains, mixing channels, setting flight modes etc. I won't talk about that in any great detail here as it is fairly standard stuff but the three screens for setting up channels are shown nearby along with a bit more explanation. Note there are inputs, mixes and outputs screens. These do the following:

- **Inputs** – this maps the physical controls (sticks, switches, etc.) to software inputs. If you look closely at the image the items down the left are the inputs; we are creating four of them on this screen. Input number 1 comes from the rudder stick (note the stick icon on the right) and its input is 100%. Input number 2 comes from the elevator stick and is set at 60% and this continues for the other inputs.
- **Mixes** – this takes the software inputs from above and allows them to be combined to form channels. This particular model is using elevon control with channel 1 and channel 2 servos controlling the port and



Inputs screen on TX12.



Mixes screen on TX12.

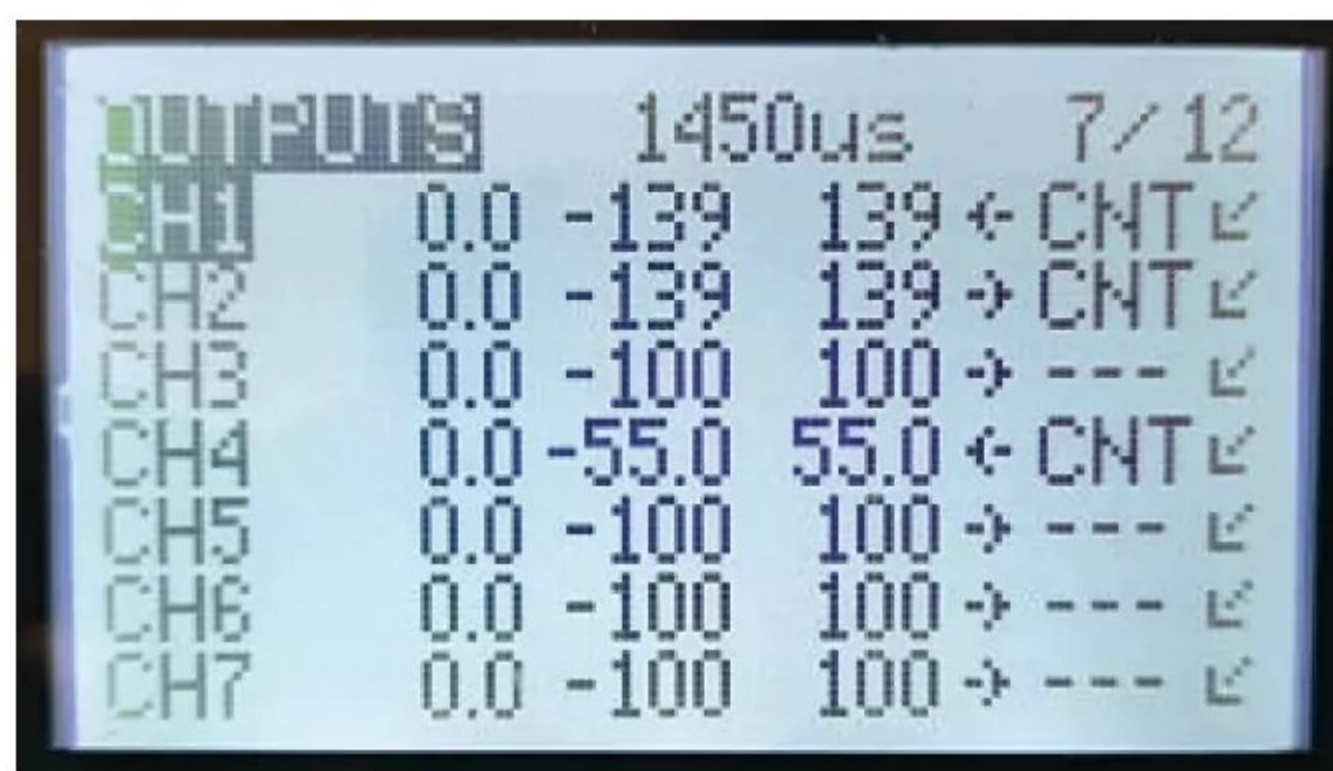
starboard elevons separately, so we mix the aileron and elevator inputs together for these. Note that the weight of the mix is controlled here.

This plane (PlanePrint Paper Plane) also has vector control on the motor and that is controlled by channel 4. When we started flying the plane we had the rudder assigned to this channel but after flying it a while we decided that instead we would mix the aileron control in here, i.e. applying

the aileron also turns the motor. We have gone for a gain greater than 100%, just to get the right balance of motor movement relative to the amount of elevon movement we want.

Note that we have the option of introducing inputs here as well if we want. The toggle switch SE has been used on channel 5 as a throttle disarm/arm switch.

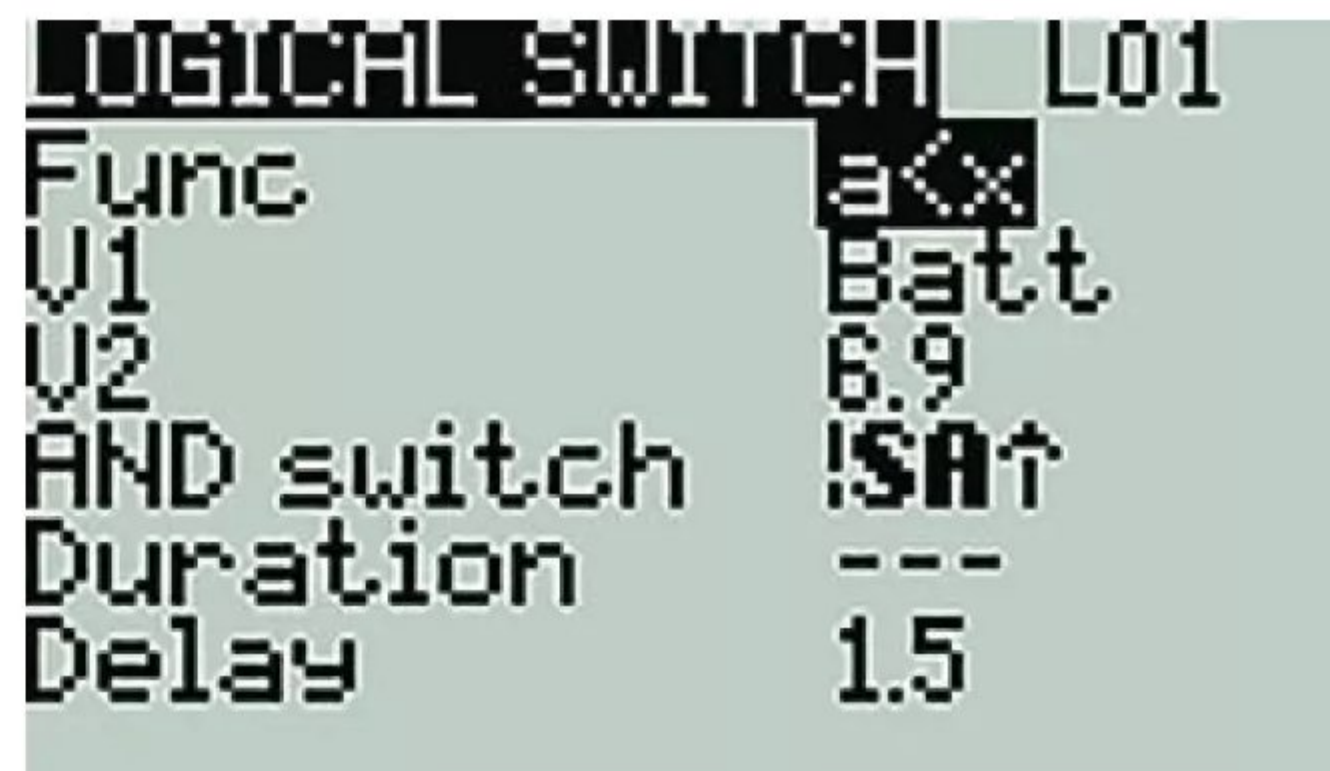
- **Outputs** – final adjustments before assigning it to a channel. The endpoint



Outputs screen on TX12.



Logical Switch monitoring Battery Voltage.



Editing a Logical Switch.

and centre values are adjusted here as well. You can see from the image we have increased the range of the channel 1 and channel 2 servos by moving the end stops to +/- 139% and we reduced the range of movement of the vector control on the motor, just to avoid it hitting the front of the fuselage. That would certainly be 'A Bad Day'!

ADDITIONAL FEATURES

However, I hear you saying, "I want more..."

Well, you have come to the right place as EdgeTX gives you the following additional features:

- Logical switches – not real switches but instead AND/OR functions that can combine the positions of several of the real inputs. Can also look at telemetry values and only do things if a certain amount of time has passed.

- Special Functions – for a special person. Yes, you! These result in some sort of action based on the inputs. The inputs can either be physical switches or logical switches. These can perform things like overriding a channel value, playing a sound, run a LUA script (more on that in a second), turn on music (yes, you can have the Top Gun anthem playing while you fly), change the displayed screen and much, much more.
- LUA – it may sound like the name of one of the professionals on Strictly Come Dancing but in fact it's a programming language that means 'Moon' in Portuguese, developed at a University in Rio de Janeiro. It is especially good for applications like our transmitters. It can be used to create unique displays on the radio amongst other things. More on that later.

- EdgeTX companion – when you are sitting alone in your man cave, sanding yet another set of balsa ribs, who hasn't wished for a companion to help pass the time. Well, your wishes have been granted! More info on each of these in the following sections.

LOGICAL SWITCHES

The picture above, centre, shows a monochrome screen with a single logical switch set up. This is taken from the EdgeTX Companion software.

This is saying that the logical switch 1 will be true if the battery voltage is less than 6.9 volts and the SA switch is in the up position. If something is true then it is shown in bold so we can see that the switch is in the up position. But L01 is not shown in bold so the battery voltage must be greater than 6.9V.



Author's Jumper trainer is perfect as the type of easy to fly model on which to practice inputting advanced settings into your EdgeTX radio.

What would you do with this information, I hear you ask? Well, if you pass the logical switch to a special function (wait for it, it's coming next!) you can have the Tx call out, "Are you listening <insert your name here>, SERIOUSLY time to land NOW!" Alternatively, if you are a more sophisticated type of person and consider that panicking is a vulgar trait, you could create a second logical function for when the battery gets to 7.2 volts and have another special function associated with that which announces, "My dear chap, your voltage is getting on the low side. Could I respectfully request that one considers a landing at one's convenience."

If you choose to edit the logical switch you will get settings like those you can see in the 'Editing a Logical Switch' image. You can choose the function from things like $a=x$, $a>x$, $a<x$ (x is a constant that you have entered, there is a second set where x is replaced by b and it compares two inputs), AND, OR, XOR, Edge (a momentary change) and Sticky (don't ask!). V1 is then the variable on the left, V2 is then the variable on the right. You can AND it with something if you want or you can leave that blank. Duration is how long it stays true when activated, Delay is how long it takes to go true once activated.

The next image shows the same logical switch settings but this time showing what would appear on a RadioMaster TX16, again generated using Edge Tx Companion. You can



Same Logical Switch screen but on a TX16.

see that the same structure of fields is present but optimised for a touch screen.

Where it gets interesting (aka headache inducing!) is you can combine one logical switches output as an input to another logical switch. By doing this very complex logical expressions can be built up. On your own head be it!

SPECIAL FUNCTIONS

Special Functions let you make your Tx go that extra mile (or should that be kilometre?). You can have your Tx talk the hind legs off a donkey or reset all of your trims, turn the volume down and even turn the backlight off.

The example nearby shows some of the capabilities. The first three lines show that changing the position of the SC switch will cause the new flight mode to be announced. Notice that the tick box on the right is empty; that means that these are disabled at the moment. The fourth line takes logical switch 2 as its input and if it goes true the special function will announce that the battery is running low.

The fifth line takes another logical switch as an input and resets Timer 1. Finally, the last two lines increase or decrease a global variable (G1) when a trim button is used. Global variables are numbers that are available to everything on the Tx and could be used by a LUA script, for example.

It is possible to create your own announcements as well. Just create them as a mpeg file and give them a unique name on the SD card.

LUA

As mentioned earlier, this is a programming language that you can either program yourself or install scripts that other people have written. (Hint: choose the latter!)

Some interesting ones you can install are listed here. There is a bitly code with each of them so type that into a web browser to get to the website where you can get more details and download it:

F3A aerobatics caller (colour screen)
bit.ly/f3a-caller

This is accessed by using the throttle trim button. One click up moves to the next call, one click down goes to the previous manoeuvre.

The TX is calling out the manoeuvre, so you don't need to look down at the controller.

GPS QR Code Generator
(monochrome screen)

bit.ly/lua-qr

Generates a QR code of the last GPS coordinates sent back from the Rx. This is very handy if your plane comes down to terra firma unexpectedly and you can't see where it landed. If your phone can scan QR codes you just do



Special Functions showing a selection of activities.

that and it then takes you directly into Google Maps. All you need to do is walk in the direction indicated. Simple!

Telemetry Widget (both colour and monochrome)

bit.ly/lua-telem

Provides information on artificial horizon with roll, pitch and yaw, battery status, altitude, home distance and a good deal more.

Whether you will have time to look down and take it all in is another story!

EDGE TX COMPANION

When the developers release a new version of EdgeTX for use on your Tx they also create versions that run on Windows, Mac and Linux.

The core of the software is the same but on the outside of that, rather than having control sticks and switches they have a Graphical User Interface (GUI) that allows you to use your PC to change settings, develop your logical switches and special functions and to simulate the telemetry to check out that the control is working as expected.

To give an example, say you have developed a special function that lets the user know when the reported GPS location from your plane has moved into an area it is not supposed to. A keep out zone in effect. Without this companion software there would be no way of testing this, other than by flying into the zone you aren't meant to be in, which kind of defeats the purpose!

With the companion you can fire up the Telemetry Simulator and change the GPS lat/long to test out this feature.

Once you are happy with all settings you can connect your Tx over USB and download all the settings to your Tx. Some screens are shown on the next page:

Main Radio Simulator

This is simulating my TX12 radio but all radios that support EdgeTX can be simulated.

Moving the control sticks or activating the switches or knobs with your mouse results in the display information updating. If a special function is triggered as a result of that the track will be played from your PC speakers.

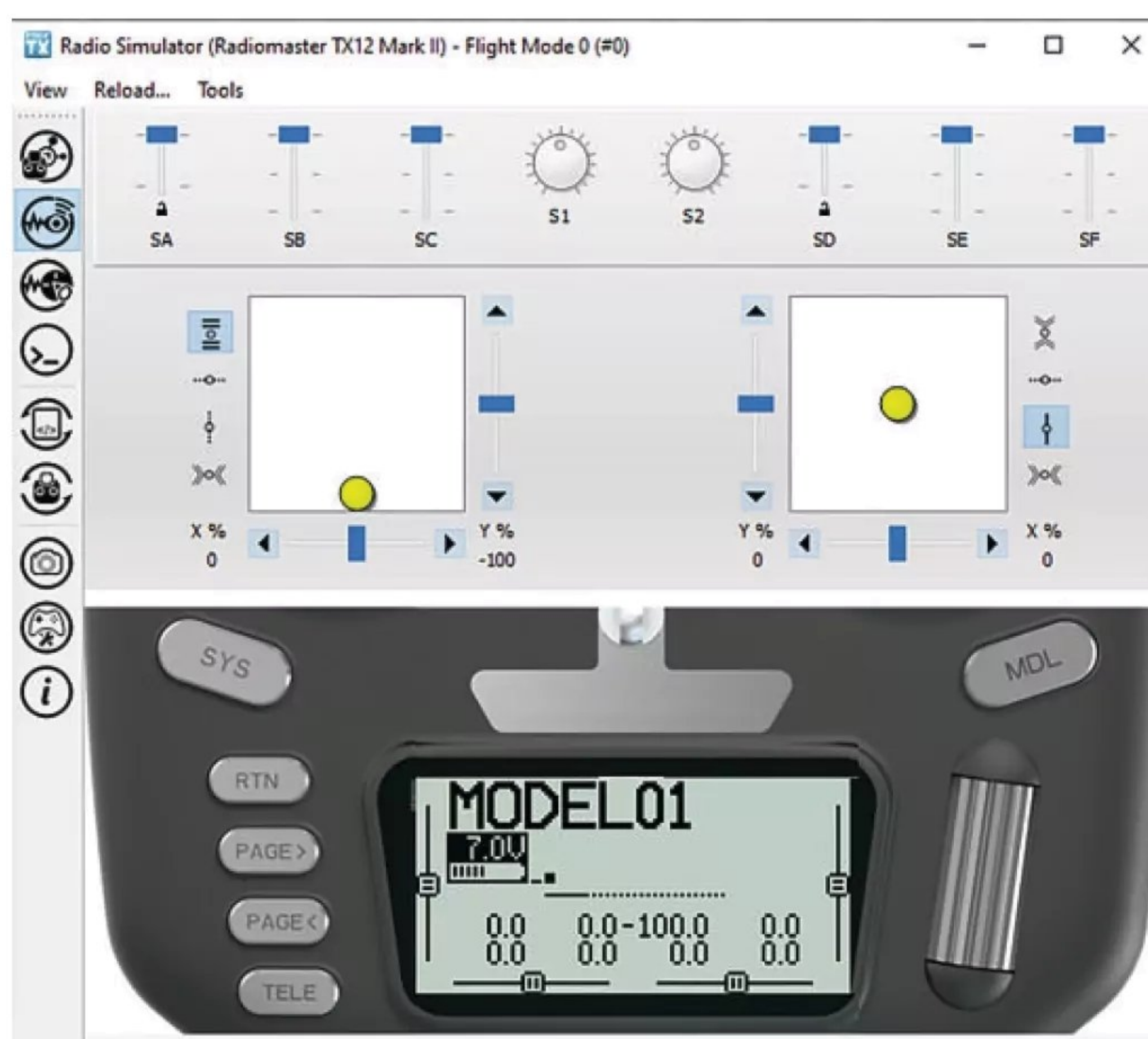
Pressing the buttons to the sides of the display produce the standard results expected.

Radio Outputs

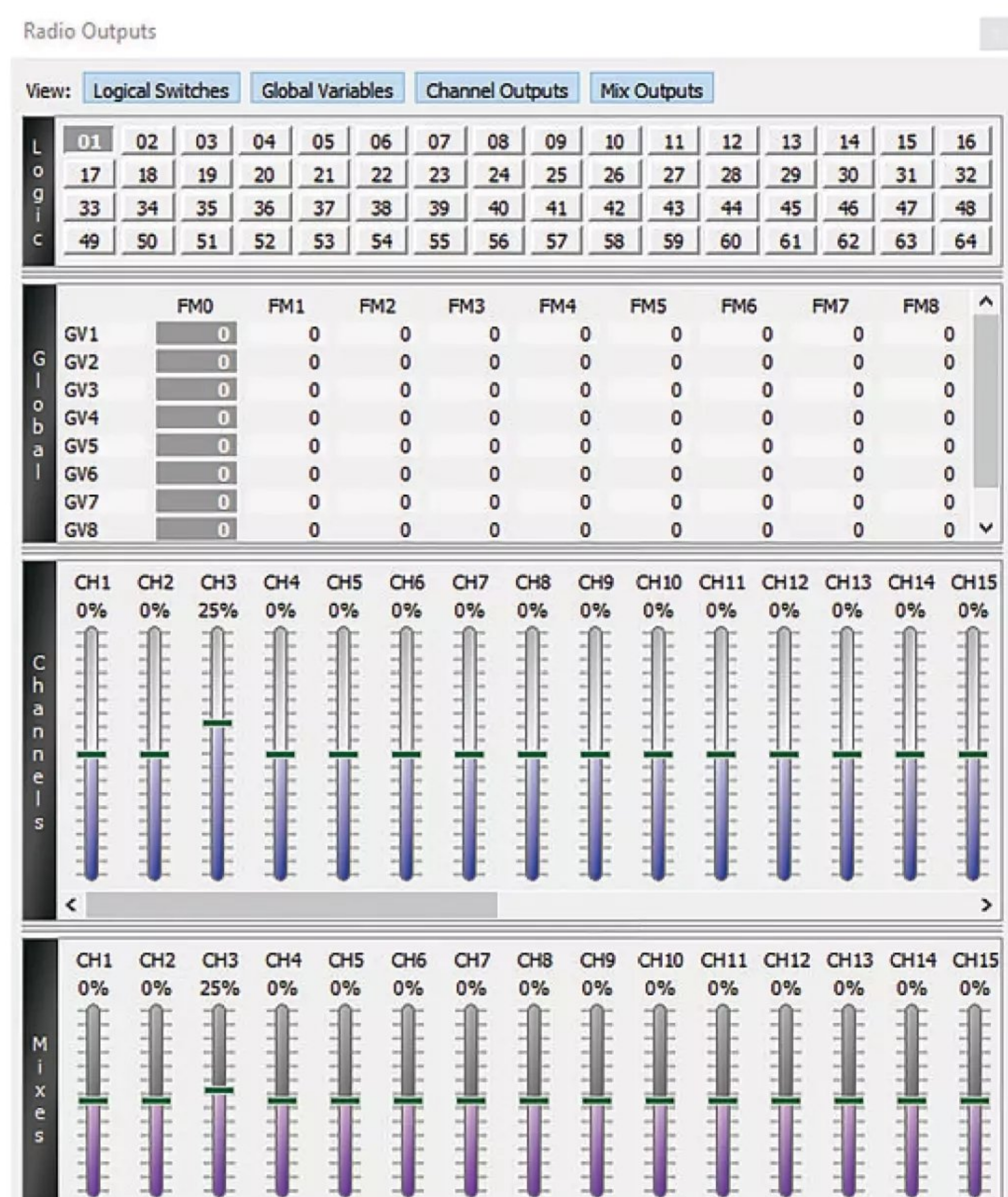
The output of the Tx setup can be seen here. These results change in real-time as the simulator control sticks etc. are moved around.

The 16 channel outputs can be seen here and any effect of mixing will also be visible. ✈





TX12 display on main screen of Simulator.



Radio Outputs on a Radiomaster TX16 screen.

The state of the logical switches can be seen at the top of the panel as the inputs are changed also.

Telemetry Simulator

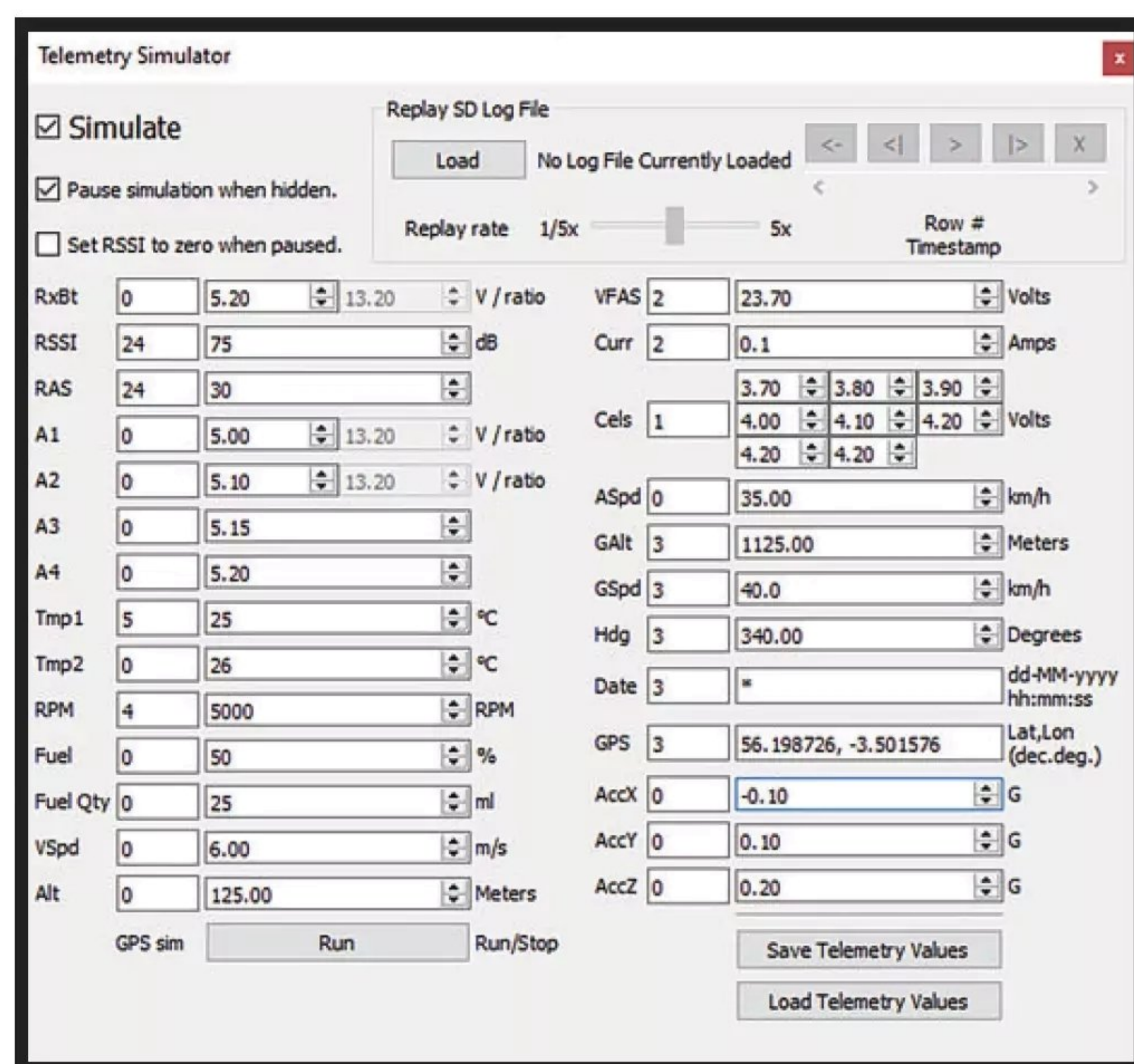
As can be seen, an extensive number of telemetry inputs can be manipulated and the effect on the Tx can be seen (and heard!) in real time.

It is also possible to load up an SD log so you can replay your last flight in glorious detail or analyse where it all went wrong!

SUMMING UP

That's it. Hopefully these articles will have given you an overview of how ELRS and EdgeTX works and maybe raised your interest in getting

“It is possible to create your own announcements. Just create them as a mpeg file and give them a unique name on the SD card.”



Telemetry Simulator.



Telemetry data as seen on TX12 Simulator screen.

some of this kit. I have summarised what I consider the pros and cons of ELRS and EdgeTX below:

Pros:

- Range anxiety is never going to be a problem!
- Very cost effective, with transmitters from £99 and six channel receivers from around £12 if you are happy to solder, £25 if not. Telemetry is included in them all.
- No supplier lock-in. Parts available from a number of suppliers avoiding any price monopoly.
- Very customisable. Logical switches and special functions can be added as required to adapt the performance of the Tx.
- LUA scripts are available to seriously customise the GUI on your Tx.

Cons:

- More of a learning curve than traditional sets like Spektrum, Futaba etc.
- Binding approach is different.
- If you go for the very cheap receivers you will need to get the soldering iron out.
- Sooner or later, you will need to update the firmware on these devices as it evolves quickly. ■

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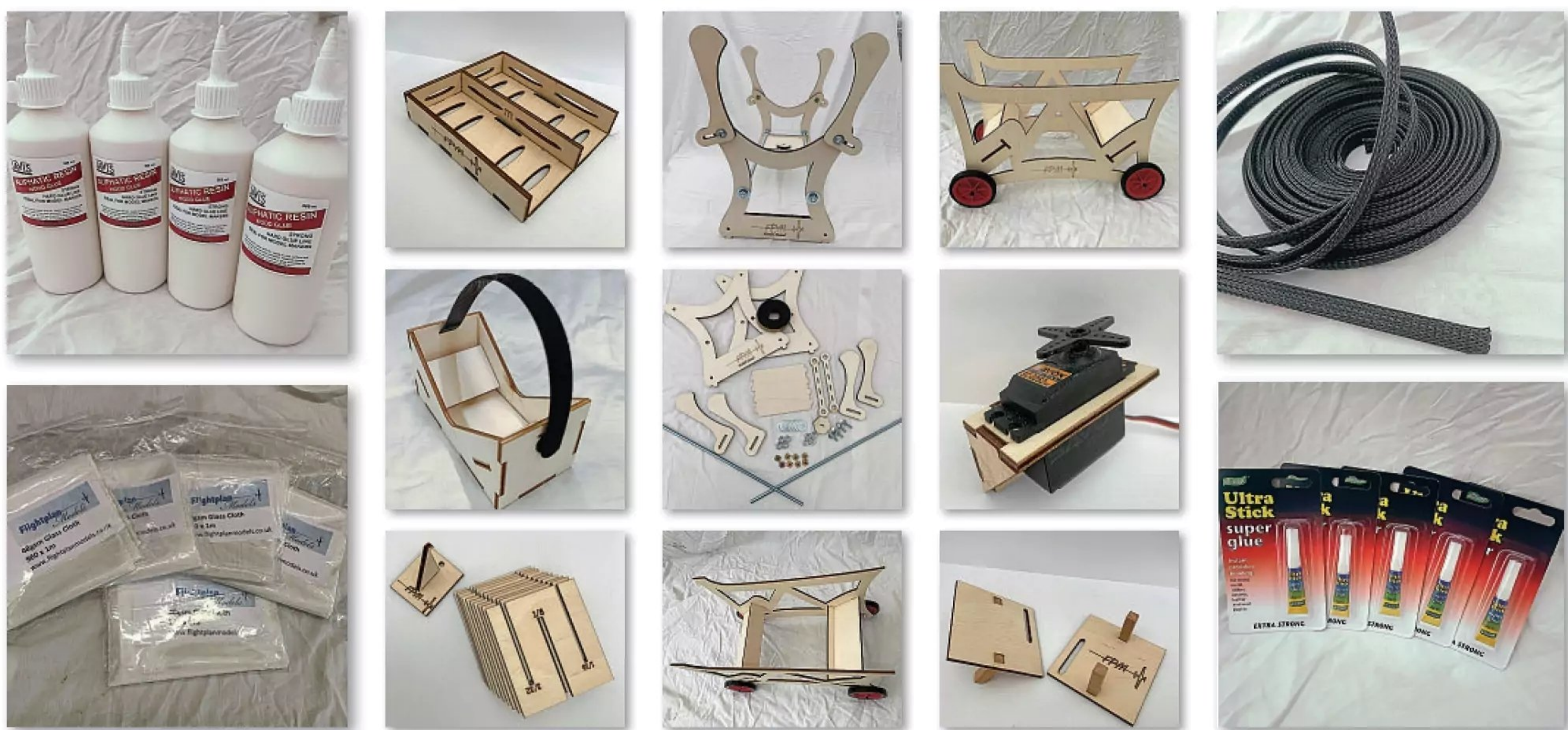
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Iwata's Kustom CS has a quality feel.



VAULT KUSTOM CS

David Ashby gets acquainted with Iwata's latest airbrush release

Words & Photos: David Ashby

Every aeromodeller should have an airbrush in their workshop. I've owned one for some 15 years now and although it only sees occasional use, perhaps when decorating a small foamie, it's good to have around.

The late Ian Peacock, an accomplished model designer, builder and writer was a skilled airbrush exponent too. Older readers may remember his Let us Spray articles in Aeromodeller. I recall seeing him use one at the Pontins Model Festival in the late 1970s to leave an impressive Scottish piper motif on the side of Len Mount's large (for the time) Bucker Jungmeister. 'Black art' were the words that came to mind, a notion that didn't change until I went along to a beginners' airbrush course many years later. We took 'em apart, cleaned them, put them back together again, sprayed lots of things and in so doing demystified the process.

Airbrushing strikes me as a bit like covering a model, be it tussing, heat shrink film or whatever; you've just got to get stuck in and accept you'll make a few mistakes along the



Purchasers will need to source an air supply and hose.



A small spanner helps secure and release the head cap.



Spray head parts. All should be removed and cleaned after every session.

road to familiarity and accomplishment. You'll wonder what you were worried about after you've successfully covered a few models and airbrushing is the same. It's about acquiring a way of working. Oh, and top tip - use diluted food colouring when you're getting to know your airbrush. It's a good way of playing around without wasting paint while avoiding fumes.

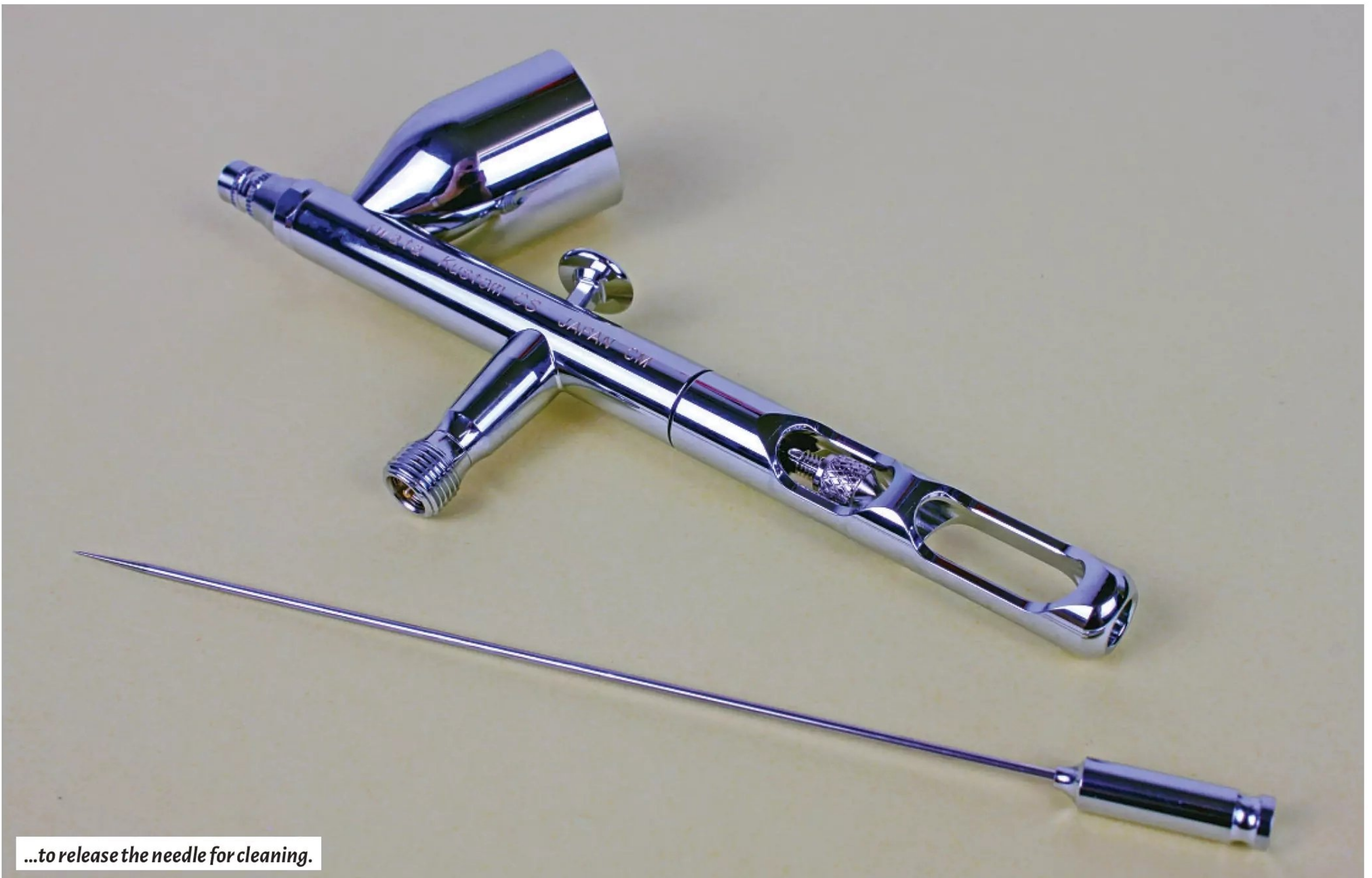
VAULT KUSTOM CS

Airbrushes come in all shapes and sizes. There are several well-known brands to choose from - Sparmax, Paasche, Badger and this one, the Japanese made Iwata, supplied by The Airbrush Company Ltd. (www.airbrushes.com).

The Kustom CS is from their Eclipse range of all-rounders and is a modern take on the ✈



The cutaway rear case means the needle lock nut is easily loosened...



...to release the needle for cleaning.



The Kustom CS has quite a wide spray pattern range.



This pistol grip filter removes moisture from the air.

classic Eclipse design. It comes with an inline grip filter although you'll need to source your own air supply and hose.

Some airbrushes use fixed paint cups (as you see here) while others have removable cups. I find that a fixed cup is less messy, although removable cups can mean faster colour changing. The pistol grip filter screws between the brush and hose, acting to separate excess moisture from the air passing through the brush. A spring-loaded release valve evacuates any build-up.



It fits between the air source and brush.



Dual action: Press down to start the air flow...



...pull back to start the paint flow. The further you pull back so the more air and paint come through.

GETTING STARTED

'Dual action' refers to the trigger. Push it down for air flow, then pull it back to release paint to the air. There's a golden rule here - air on first, air off last. In other words, always press the trigger down before you pull it back. Introduce paint to the air slowly then reverse the process before you stop. It's to avoid paint accumulating at the tip and splattering the model when air is introduced.

Achieving the spray width required is a combination of trigger control and moving the brush closer or away from the work. Practice makes perfect, although the sort of spraying I usually do (small foamies and plastic kits) rarely requires a very thin spray pattern. As for paint, I tend to stick with Tamiya and Humbrol acrylic colours, usually thinned with the manufacturer's bespoke thinner, never water.

Oh, and I always wear a face mask when spraying. You hear some people referring to the water-based nature of acrylic paint as reason not to bother. But just a sniff will tell you that



Vary the distance between the brush and the work to achieve the strength required. Practice really does make perfect.

there's more than just coloured water hitting your model and it's not really something you want coating the inside of your lungs.

CLEANING

Cleaning down an airbrush after use seems easier and quicker the more you do it. Have plenty of kitchen towel to hand, some airbrush cleaning fluid of course and a paintbrush to help clean away build up at the bottom of the cup. There are plenty of videos online for reference.

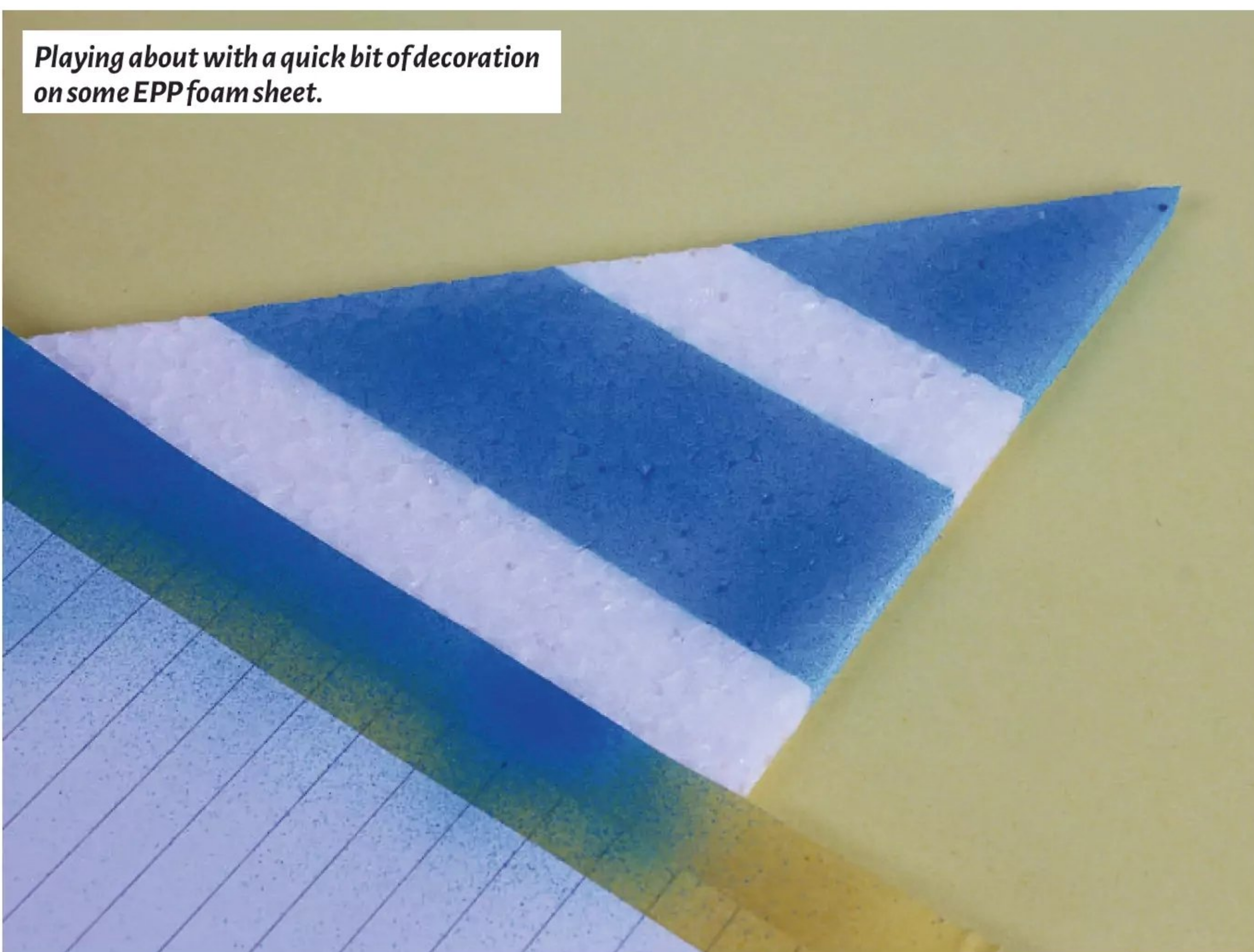
The spray needle bar slides out easily for cleaning and what's nice about this Kustom CS is how the new cutaway design means the needle's locking nut is easily loosened without the need to first remove the rear casing.

It's not necessary to use the lubricant after every spraying session, but perhaps just occasionally or before a planned period of storage. I've acquired a couple accessories that have proven very useful over the years. First up, a spray-out cleaning pot that captures spray and fumes during the cleaning process. Cleaning can generate more fumes than the spraying itself, so a pot is especially handy if your work area isn't so well ventilated. Next, a brush rest; somewhere to place the brush if spraying is interrupted or you're attending to something else part way through.



First appearing in 1984 and still in print, Ian Peacock's book is the go-to reference work for aeromodellers.

Playing about with a quick bit of decoration on some EPP foam sheet.



LIFETIME USE

I've enjoyed getting to know this new arrival. If you didn't know Iwata are the Mercedes Benz of the airbrush world, with a range of beautifully made brushes that carry a fine reputation. Look after this Kustom CS and it'll last a lifetime. ■

DATAFILE

Name:	Iwata Vault Kustom CS
Product type:	Gravity feed dual action airbrush
Manufactured by:	Iwata
UK distributor:	The Airbrush Company Ltd.
	www.airbrushes.com
RRP:	£259
Spray scale:	Fine line to 2" (0.35 mm – 50 mm)
Optimal working pressure:	25 - 35 psi
Paint capacity:	14 ml
Supplied with:	Moisture filter
Required for operation:	Air source, connecting hose

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

JUNE

June 15

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

June 21

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

June 26

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

June 28 – July 6

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

JULY

July 3

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

July 6

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

July 12

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

July 12 - 13

Woodspring Wings 25. Model Aircraft Show. From 10.00am to 16.30pm. The Woodspring Wings Model Aircraft Show has been a regular fixture on the flying calendar since shortly after the club began in 1989. It has since grown to be the biggest model aircraft show in the Southwest and attracts around 4000 visitors each year. The show features all-day model flying displays by some of the country's top pilots, plenty of traders and food and drink to suit all tastes. In recent years we have also enjoyed fly pasts by the BBMF Lancaster, the Red Arrows and the BBMF Spitfire, something we hope to continue every year. Located near Yatton in the Somerset Levels, Woodspring Wings is ideally placed to run a show of this size and popularity. The club owns a total of 21 acres of land including the flying field itself and adjacent fields meaning ample space for the event and plenty of free parking available. For more information please visit www.woodspringshow.co.uk or on Facebook. Camping available on site for the weekend with good advance discounts.

July 12 - 13

Pontefract 13th Annual Fly-In Weekend at Pontefract Park, southwest corner of junction 32 of

the M62. Sat nav - WF8 4QD. Entry via huge white gate 1/4 mile south towards Pontefract. Further details see map on www.pandas.bmfa.org. Saturday 12th July - any R/C model type (electric or IC), plus control line (no free flight). On Sunday 13th July - 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). Free entry, further details and updates at www.singlechannel.co.uk. To fly you must have insurance and your CAA documentation up to date plus any model over 7.5 kg requires BMFA B, LMA proficiency or equivalent recognised certification. However, feel free to bring along your models and display them if you don't want to fly. Limited free camping available, contact: Phil Green (philg@talk21.com) or Shaun Garrity (aeromodeller@gmail.com)

July 19

Christchurch & District MFC Open Waterplane event is at Longham Lake on Saturday 15 July, 9:00 am to 15:00 pm. For electric power models, no IC or turbines. EDF by arrangement. Longham is a few miles north of Bournemouth. Full details are at www.cdmfc.org and the Longham pages. Parking is 200 m from the flying point and there are toilets on site but no other facilities so bring your own lunch! There will be a rescue boat for unlucky models. Contact Mike at roachfoxwood@aol.com three days before for weather check.

July 20

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

July 20

UKCAA @ Retford MFC at Bollington, Macclesfield, Cheshire, SK10 5AJ. Classic Aerobatics. This is a Fly-in with an informal contest over the lunch break. The contest will be to UKCAA Pick5/Pick7 rules plus a new fixed novice schedule for beginners. Guests and non-members are very welcome. Bring along any traditional aerobatic model (e.g. AcroWot) and enjoy the fun. For more information, please contact Martyn Kinder on 079890 25198 or email martyn@czd.org.uk

July 20

Classic Glider Fly-in at the Hole of Horcum, North Yorkshire, YO18 7NR. A fun day for all traditionally built R/C model gliders. BMFA membership required. £5 for non-members. Location on What3Words: snowmen. ordinary.caps. Lat - 54.332235. Lon - -0.690234. Walk to slope by 10:00 am and for more information contact Michael Kitchen on 01347 810685. Due to local MOD restrictions please contact beforehand for details.



AUGUST

Aug 2-3

Melton & District Model Club 60th Anniversary Model Show on Saturday to Sunday 2-3 August 2025 from 10.00 am to 4.00 pm at Longfield Academy, Ambleside Way Melton Mowbray, LE13 0BN. R/C Aircraft and Helicopters, Model Boats, Slot Cars, Model Railways, Drones, Meccano, Classic Car Show, Swap Meet, Car Boot Sale, Tabletop Wargaming, BMFA Flight Simulator, Tombola & Raffle with prizes provided by Hornby Hobbies. Refreshments available. Free Parking. Call 07976 710270 for more information on Swapmeet, Car Boot & Classic Cars. Bookings or e-mail us meltonmodelclub@hotmail.com for further details

Aug 2-3

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

White Sheet RFC Scale Event. Scale Days could be either Saturday or Sunday, with the preferred day always being a Sunday. After analysing the forecasted conditions, the Scale Secretary will make the final on/off call on. Please note the reserve date of the 31st. Please check with the WSRFC before travelling: <https://whitesheet.bmfa.club>

Aug 17

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

Aug 16-17

Fun Fly Nationals at BMFA Buckminster. This is the formal British National Championship event for all the BFFA Classes, including the Foamy Class. First timers and novices are still most welcome. As this event will be held at BMFA Buckminster with camping available via manny@bmfa.org. Rules and general info at www.funfly.bmfa.org or via the Fun Fly Group Facebook page. Note that there is an A cert requirement for this event. If you would like to enter, please contact James Gordon, jamesrgr@hotmail.com or tel 07966 439835.

Aug 16-17

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 23-24

White Sheet RFC F3F English Open. Please check with the WSRFC before travelling: <https://whitesheet.bmfa.club>

Aug 24

UKCAA @ East Cheshire MFC at Bollington, Macclesfield, Cheshire, SK10 5AJ. Classic Aerobatics. This is a Fly-in with an informal contest over the lunch break. The contest will be to UKCAA Pick5/Pick7 rules plus a new fixed novice schedule for beginners. Guests and non-members are very welcome. Bring along any traditional aerobatic model (e.g. AcroWot) and enjoy the fun. For more information, please contact Martyn Kinder on 079890 25198 or email martyn@czd.org.uk

SEPTEMBER

Sept 5

UKCAA @ Buckminster, BMFA NFC, Lincolnshire, NG33 5RW. Classic Aerobatics. This is a Fly-in with an informal contest over the lunch break. The contest will be to UKCAA Pick5/Pick7 rules plus a new fixed novice schedule for beginners. Guests and non-members are very welcome. Bring along any traditional aerobatic model (e.g. AcroWot) and enjoy the fun. For more information, please contact Martyn Kinder on 079890 25198 or email martyn@czd.org.uk

Sept 7

Basingstoke Model Aero Club's 20th Electric Fly-In at Deane, Basingstoke, Hampshire. Please make a note in the diary and come along to our 20th annual 'Electric Fly-In'. Take part in some great flying, view and discuss all things electric. In the past there have been some stunning models. Relaxed flying from 10:00, briefing 9:45. Prize giving and raffle at 16:00. Fee barbecue, soft drinks, tea and coffee. Prizes for best model and a raffle so please bring some change. Toilet on site. Obviously, the event is weather dependent so on the day go to the club website or FB page and there will be a message confirming if it's on or off. Location and full details <http://bmac.bmfa.club/events> or @basingstokemac on Facebook

Sept 7

White Sheet RFC Scale Event. Scale Days could be either Saturday or Sunday, with the preferred day always being a Sunday. After analysing the forecasted conditions, the Scale Secretary will make the final on/off call on. Please note the reserve date of the 28th. Please check with the WSRFC before travelling: <https://whitesheet.bmfa.club>

Sept 13

Christchurch & District MFC Open Waterplane event is at Longham Lake on 13 July, 9:00 am to 15:00 pm. For electric power models, no IC or turbines. EDF by arrangement. Longham is a few miles north of Bournemouth. Full details are at www.cdmfc.org and the Longham pages. Parking is 200 m from the flying point

and there are toilets on site, but no other facilities so bring your own lunch! There will be a rescue boat for unlucky models. Contact Mike at roachfoxwood@aol.com three days before for weather check.

Sept 13

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

Sept 14

Scale Glider Fly-in at the Hole of Horcum, North Yorkshire, YO18 7NR. A fun day for all R/C model scale gliders. BMFA membership required. £5 for non-members. Location on What3Words: snowmen. ordinary.caps. Lat - 54.332235. Lon - -0.690234. Walk to slope by 10:00 am and for more information contact Michael Kitchen on 01347 810685. Due to local MOD restrictions please contact beforehand for details.

Sept 20-21

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/

Sept 21

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

OCTOBER

Oct 5

White Sheet RFC Scale Event. Scale Days could be either Saturday or Sunday, with the preferred day always being a Sunday. After analysing the forecasted conditions, the Scale Secretary will make the final on/off call on. Please note the reserve date of the 12th. Please check with the WSRFC before travelling: <https://whitesheet.bmfa.club>

Oct 10

UKCAA @ North Berks RMAS at NBRMAS, Landmead Farm, Garford, Oxfordshire, OX13 5PA. Classic Aerobatics. This is a Fly-in with informal contest over the lunch break. The contest will be to UKCAA Pick5/Pick7 rules plus a new fixed novice schedule for beginners. Guests and non-members are very welcome, bring along any traditional aerobatic model (e.g. AcroWot) and enjoy the fun. For more information, please contact Martyn Kinder on 079890 25198 or email martyn@czd.org.uk

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SEBART KATANA 30E. Yellow, black and red trim. Turnigy 3542/1000, 60A ESC with fitted pilot, instruments, Hitec servos, 2200/3s. Flies superbly. Will take larger LiPos, in mint condition - £295. Buyer to collect. 01243 514042 (Chichester).

ENGINE, planes, electric planes, electric glider, flight box, batteries, two transmitters, chargers – offers? 07496 710948 (Cams).

VARIOUS MODELS for sale. Scale vintage gliders, control line, plus other bits – offers? Call John on 07864 297226 (Dorset).

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SEVEN A/C, Solartex covered, flown twice. For trimming with battery, motor, some with FRSKY Rx. Also, two IC models - Pete 68" wingspan, WOT 4 53" wingspan, both with Futaba Rx. RCV91 CD unrun, new and boxed. OS 46 AX run in only and boxed. Flight box, starter – offers? Buyer to collect (Suffolk).

GENTLE LADY GLIDERS, Phase 4, Phase 2 and others – offers? Call Graham on 01453 757904 (Glos).

TEN YEARS OF RCM&E, complete sets – free? Buyer to collect. 07771785505 or email blue.hills@btinternet.com (Battle).

BRIT PACK KIT, Ambassador Products 'Musketeer'. 40 size aerobatic airframe built during lockdown, brand new and unflown. Fitted with an O.S. 40 Surpass 4-stroke, four servos and Rx battery. Fit your Rx and fly - £80. Buyer to collect. Call Ian on 01460 394579 (Somerset).

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

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

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

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

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

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

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

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

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ALL R/C MODELS, planes, boats, cars, kits, engines, radios etc. Complete collections wanted. Cash buyer, will collect countrywide. Email dorsetmodel@aol.com or call Michael on 01747 229725 (Dorset).

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

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Next issue

MODEL MAGIC

After visiting the 2018 F4 Scale World Championships when 13 years old, Matthias Hausmann was inspired to build the Robin DR400/180 flown from his local airfield. The Jodel 'Remorqueur' is a well-known French light aircraft which is often used for glider towing. The French word 'remorquage', which is similar to 'remorqueur', means 'towing'. Laichingen is a small airfield and in the following years Matthias

would earn his glider pilot's licence there and fly in this Jodel, as well as being towed by it.

So, the perfect conditions were in place to build and fly a scale model of this aeroplane. With the help of CAD software, Matthias and his father Marcus created their own plans. The ribs and formers were cut from poplar plywood on their CNC milling machine and within a few days they had the basic structure of the fuselage and wings.



SCALE INDOOR NATIONALS

In his latest 'Make It Scale' column Danny Fenton makes his annual pilgrimage to the Scale Indoor Nationals held in the Walsall Campus Sports Hall of Wolverhampton University. Saturday was for the radio control modellers. The Flying Only class began first, continuing into early afternoon. Next was Kit Scale and finally, towards the close of the day, the Open Scale creations were brought out. At lunchtime the usual pylon race was held, which was great fun. Sunday saw the free flight participants do their thing and it was wonderful to witness some truly stunning models.

SLINGSBY SKYLARK 1

Join Chris Williams as he continues to describe the build and flying of his one-sixth scale Skylark 1 glider, along with the remaining two sheets of the model's pull-out Pro-Plan, the first two being published in the last issue. This aircraft makes a very handily sized glider and fits nicely with Chris's previous scale models at this scale. The prototype has a surprisingly flat glide for a model of this size and the controls are effective in all planes. Equally at home behind a tug or on the slope the little Skylark packs an awful lot of fun into such a small package.



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PARTING SHOT



HARRIER DOWN

Tony Nijhuis was displaying his very impressive VTOL Harrier at the 2024 Basingstoke All Electric Fly-In when one of the EDF units disintegrated mid hover with catastrophic results. Less than one second covers the sequence of events shown here. It took Tony a

little longer to repair but the Harrier was soon back in the air for more testing.

Tony's model is 1.1M span and flies using four 62 mm EDF units fed by a single 5S 3200 mAh LiPo. Each fan is gimballed for back, forth and yaw control. The model uses quadcopter

stabilisation and, at the time of writing, was the only VTOL model Harrier capable of truly transitioning from hover to conventional flight. It's an amazing achievement that took three years and 13 prototypes to achieve!

Mike Freeman



PHOTOFILE

Photo:	Mike Freeman
Lens:	Nikon VR 18-200mm f/3.5-5.6 G
Exposure Mode:	Aperture Priority
Aperture:	f/5.6
Shutter Speed:	1/640s
Focal Length:	200mm
ISO:	140
Metering:	Centre Weighted
Exposure Comp:	0EV



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SPECIFICATIONS:

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Wing Area: 544sq.in
Weight (Ready to fly): 3.8 - 4.1kg
Engine: .55 (2-stroke), .72 - .82 (4-stroke)
or electric equivalent
Radio: 6 channels with 4 standard servos
and 2-3 mini servos (for flaps & throttle)

OPTIONAL E-RETRACTS & STRUTS:



£109.95

RECOMMENDED MOTOR:



Electrospeed Boost
50 Power Pack
ELE008

£104.95

AT-6 TEXAN

'Castrol'



VQA01-N

Wingspan: 60.5in (1540m)

£259.95

P-51B MUSTANG

'Tuskegee Airman'



VQA05

Wingspan: 58.2in (1478m)

£249.95

FOKKER D.VII

'Black/White'



VQA167BW

Wingspan: 68in (1730mm)

£359.95

DH-82 TIGER MOTH

'Red/Silver'



VQA139R

Wingspan: 55.12in (1400mm)

£279.95

PIPER P-38 TOMAHAWK

'US'



VQA163US

Wingspan: 74.8in (1900mm)

£359.95

CESSNA 172 SKYHAWK

'Red/White'



VQA161GE

Wingspan: 68in (1730mm)

£299.95

PILATUS PC-6

'Skydive Marche/Tiger'



VQA0361

Wingspan: 62.2in (1580mm)

WAS: ~~£229.95~~
NOW: **£169.95**

DOUGLAS DC-3

'Lufthansa'



VQA129

Wingspan: 70.8in (1800mm)

WAS: ~~£299.95~~
NOW: **£224.95**

The XFly Spitfire is a scale replica of this iconic fighter based on the famous Mk.IX variant, with a 1200mm wingspan and constructed using EPO foam and painted in two distinctive matte finish scale colours and livery.

XFly captures the beautiful classic lines of the Spitfire Mk.IX with scale details including a 4-blade propeller, accurate canopy outline, pilot figure, exhaust stacks, cannons and outward retractable landing gear.

Supermarine Spitfire Mk. IX

FEATURES:

- High power 3541-KV745 motor and 40A brushless ESC offering outstanding thrust
- Electric retractable landing gear with shock absorbing struts
- Large battery hatch for easy placement of the battery and radio equipment
- Available in Green D-Day invasion version and Brown desert version
- Scale four panel split flaps for easier takeoffs and landings
- LED wingtip lights for added visibility and realism
- Scale 4-blade propeller

SPECIFICATIONS:

- Length: 1010mm/39.8"
- Wingspan: 1200mm/47"
- ESC: 40A
- Flying Weight: 1350g
- Wing area: 22dm²
- Motor: 3541-KV745
- Propeller Size: 11x7" 4-blade
- Servos: 9g servos x 6
- Recommended Battery: 4S 2600-4000mAh
- Radio: 6CH- aileron, elevator, throttle, rudder, retract, flaps
- Skill Level: Intermediate

Requires: Radio, battery and charger to complete



E&OE

XFLY-MODEL

Part No: XF123P-B (Desert Brown) or XF123P-G (D-DAY GREEN) 1:2M SPITFIRE MK.IX W/O TX/RX/BATT

RRP: £ 299.99

CML

CML PRODUCTS ARE AVAILABLE IN ALL GOOD MODEL & HOBBY SHOPS. CHECK OUR WEBSITE FOR FULL DETAILS

WWW.CMLDISTRIBUTION.CO.UK



PLEASE VISIT WWW.SARIKHOBBIES.COM TO VIEW ALL AVAILABLE PLANS

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RETRIEVAL SYSTEM WITHOUT PRIOR PERMISSION IN WRITING FROM THE PUBLISHER.



SOLID BA
TO WINC

OLY 2B CANOPY
FROM SARIK

3mm SQ. SPRUCE

6mm x 3mm
MAGNETS

3mm B

C3

C2

F4A

K2

ALL PLY SHEETING

F1

F2

F3

F4

MPX STYLE PIN & ROD
RELEASE FITTED TO
PROTOTYPE

F2
2mm PLY

FACE WITH 1mm ALUMINIUM

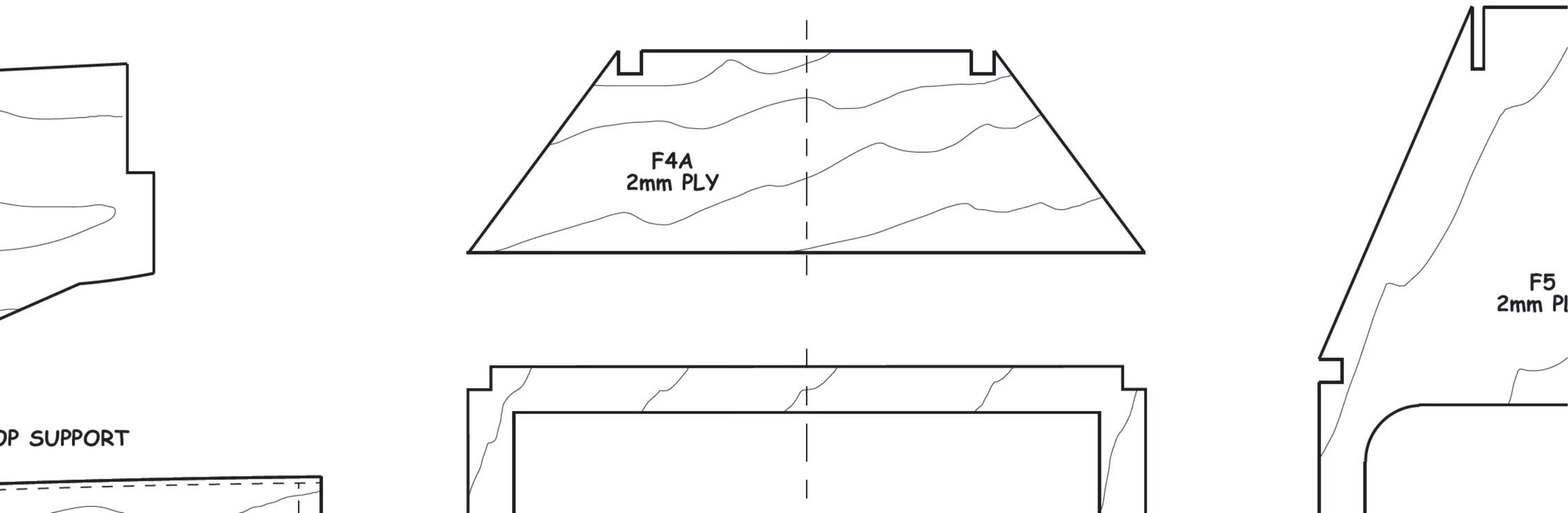
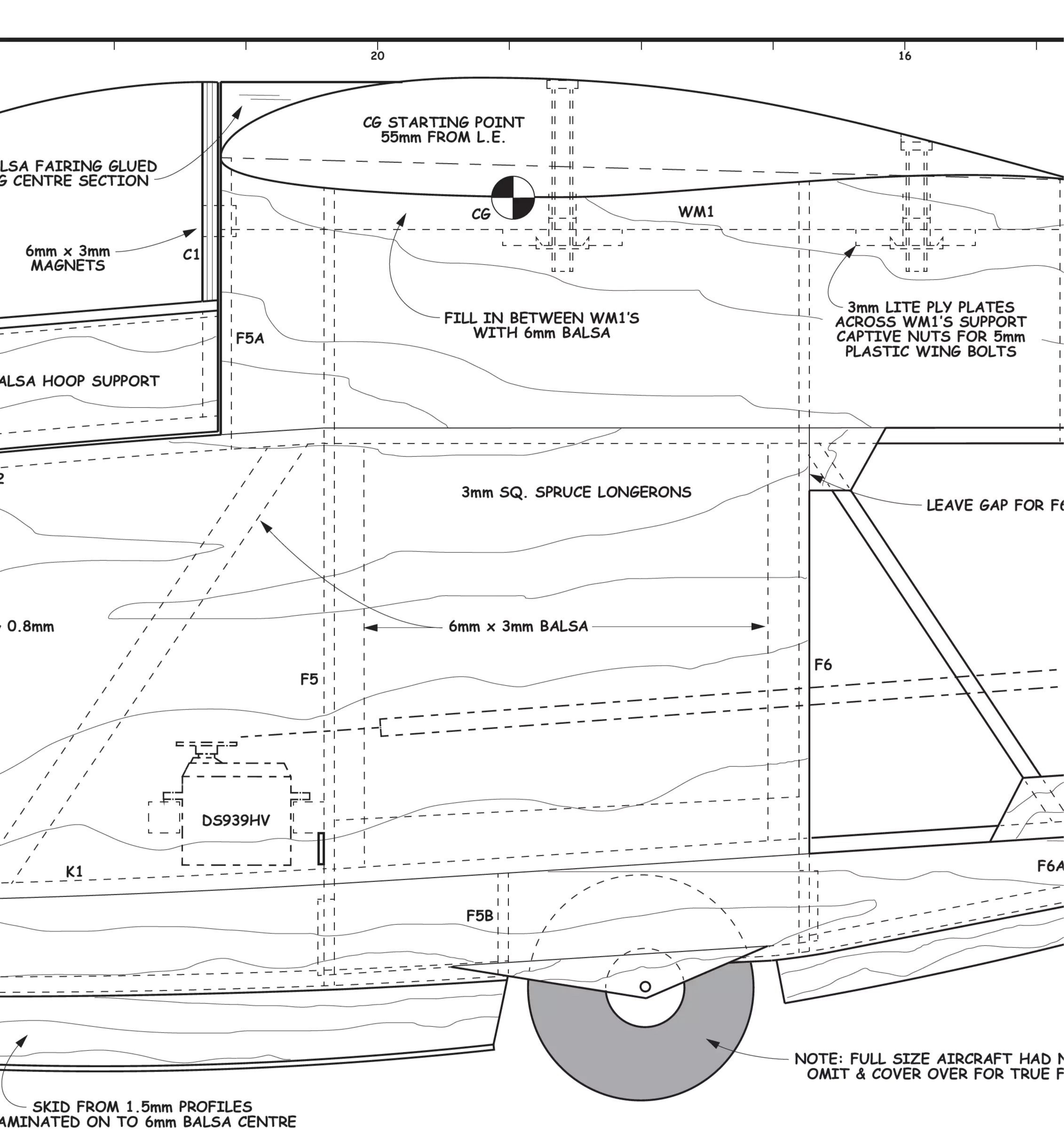
WHEELBOX SIDES
2mm PLY, 2 OFF

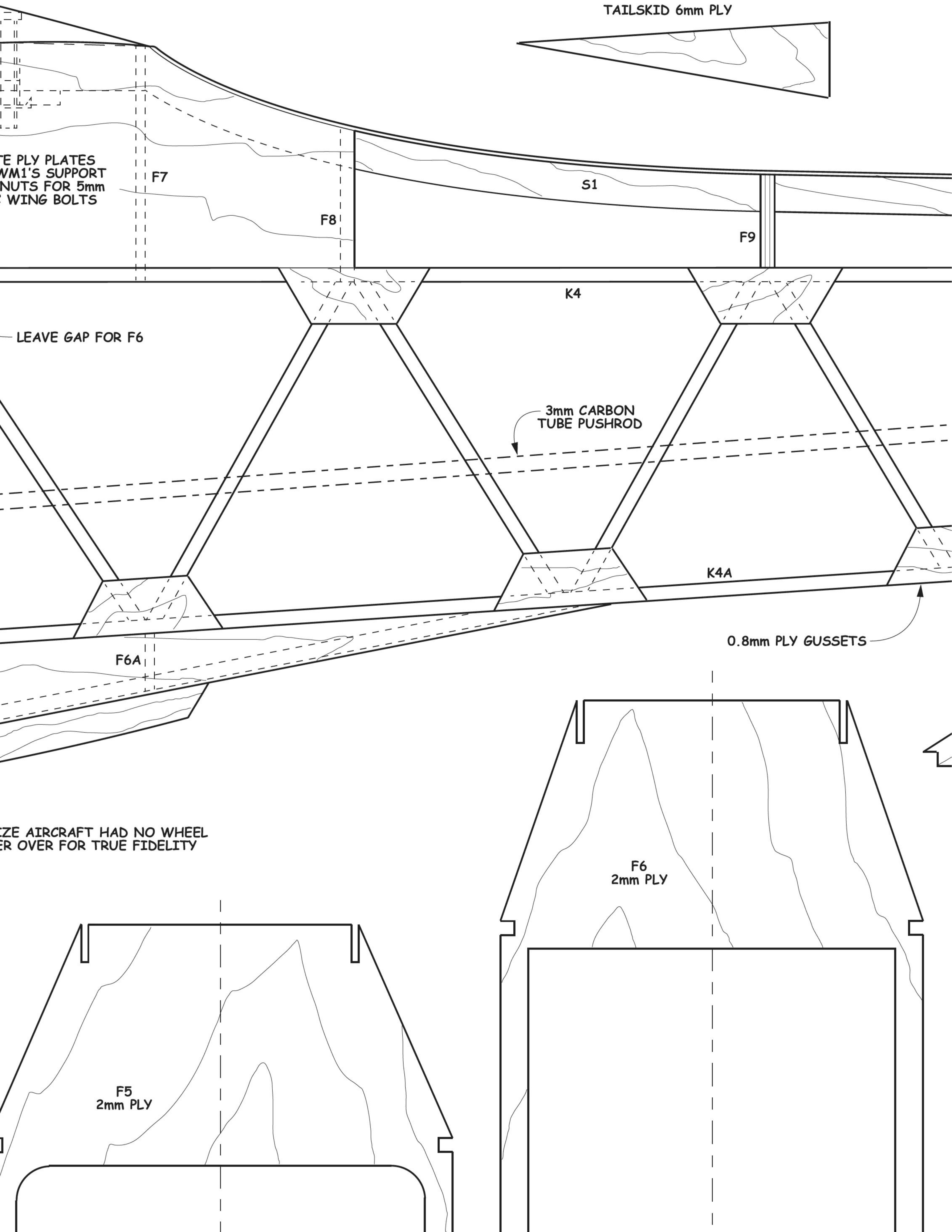
3mm Balsa HOC

500

400

300





RCM&E

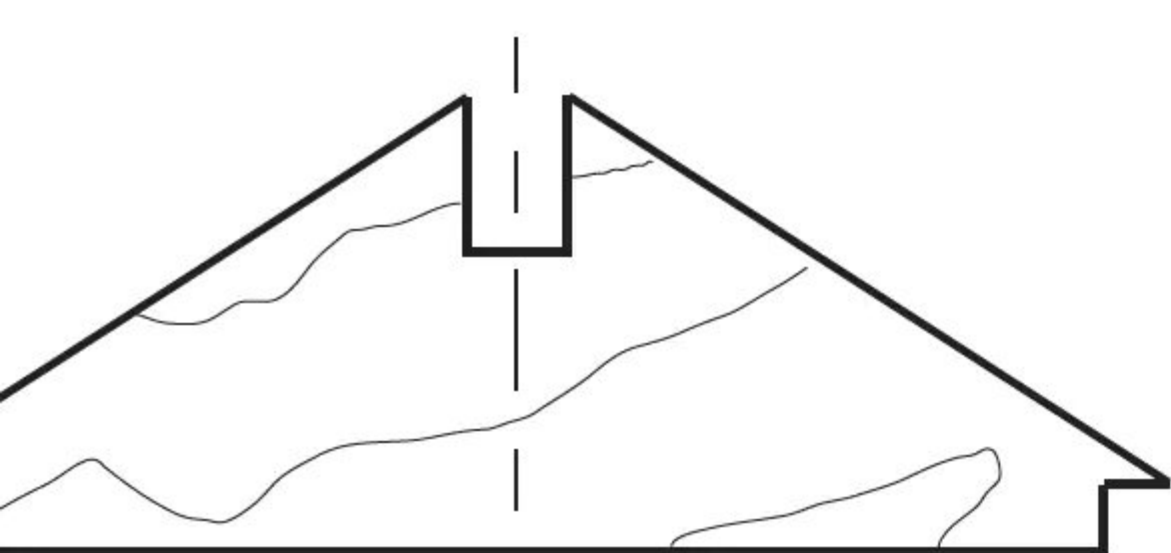
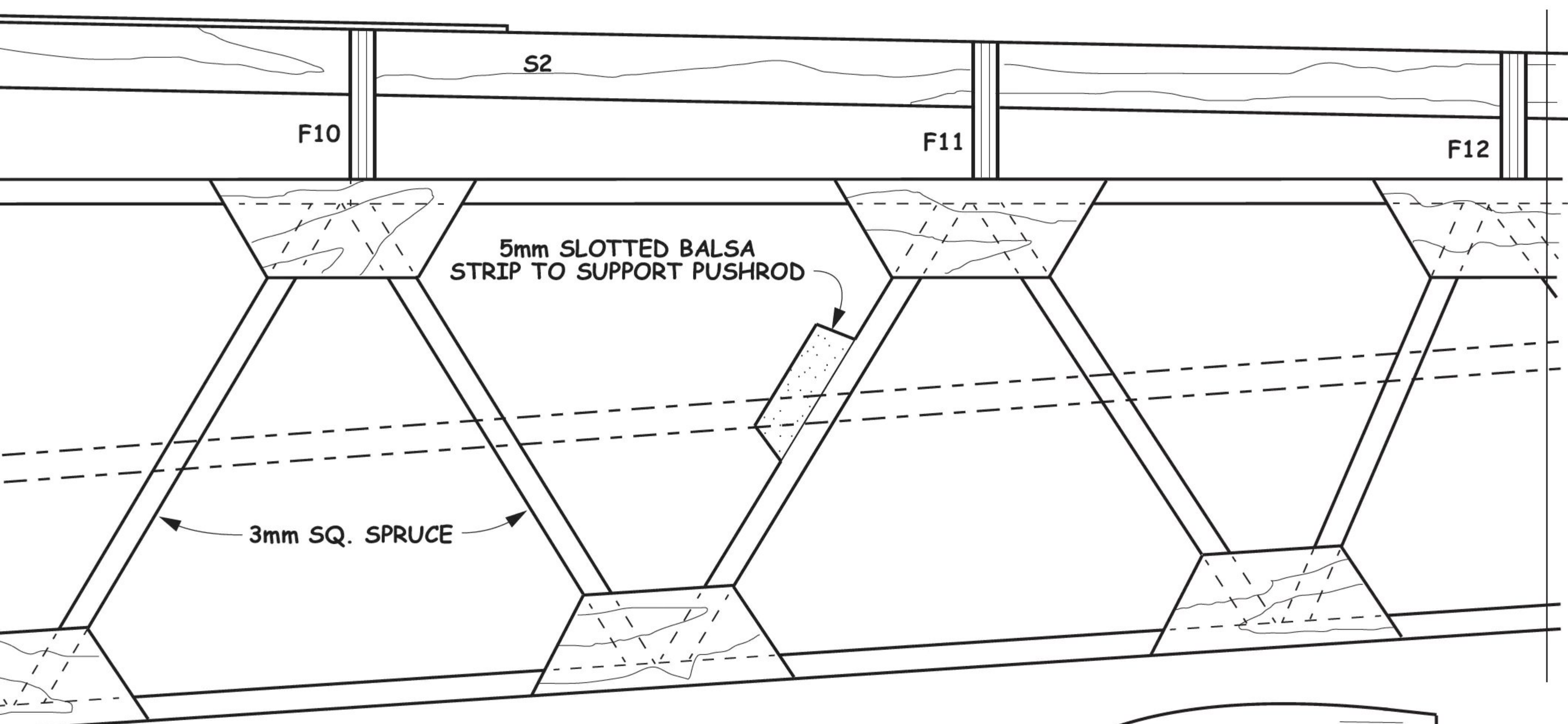
SLINGSBY TYPE 37 SKYLARK 1

BY CHRIS WILLIAMS

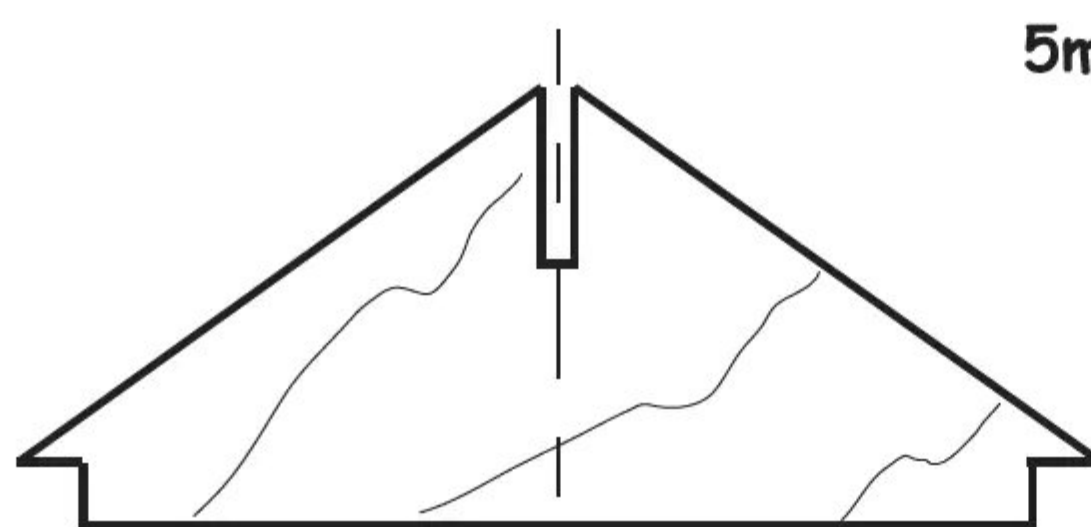
PLAN No RC2274

No. OF SHEETS: 1 OF 4

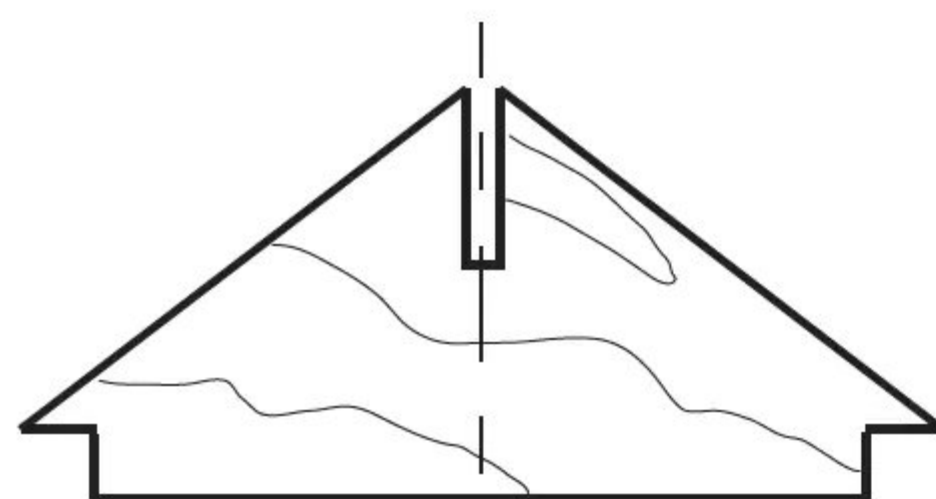
First published in
RCM&E July 2025



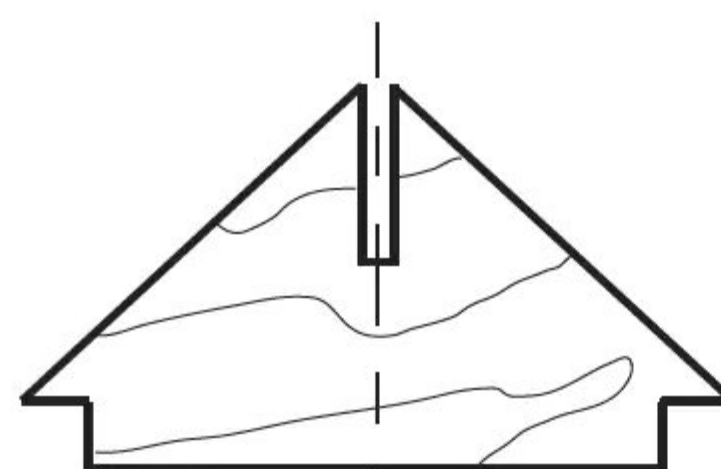
F10
3mm LITE PLY



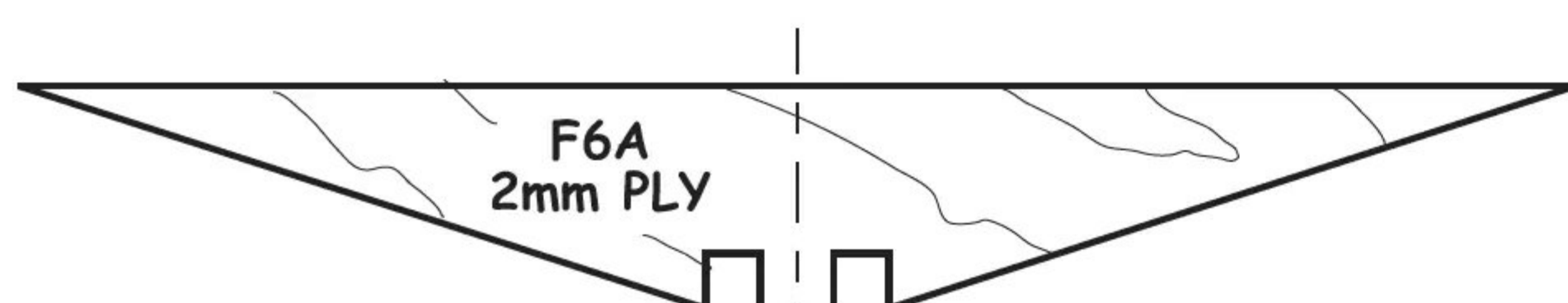
F11
3mm LITE PLY



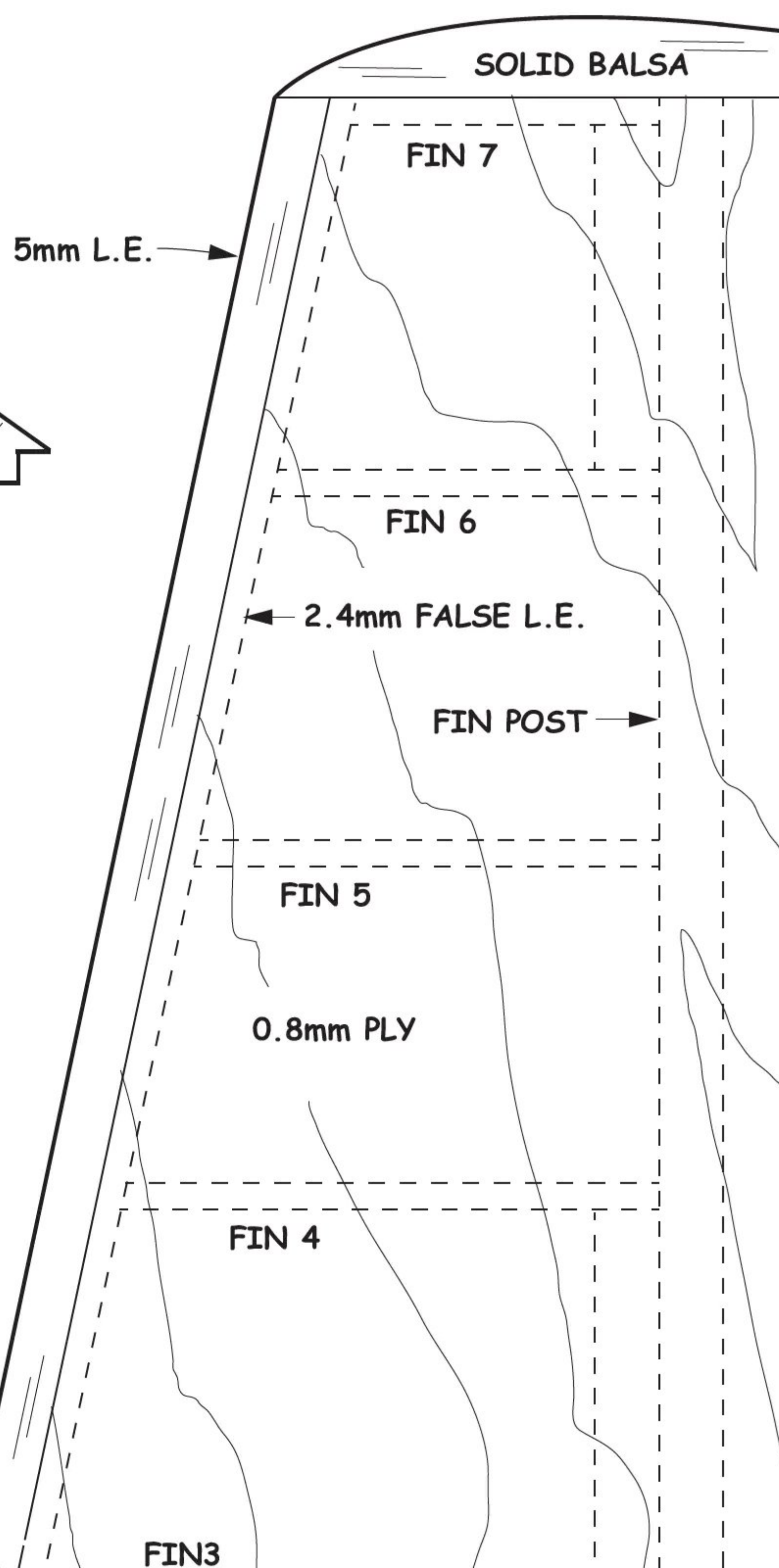
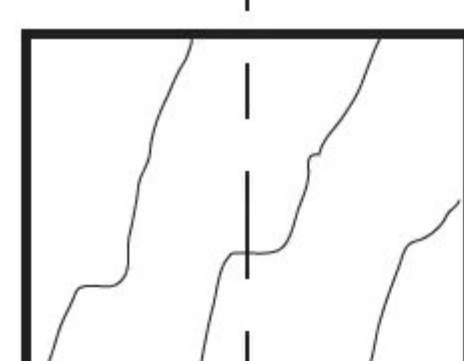
F12
3mm LITE PLY

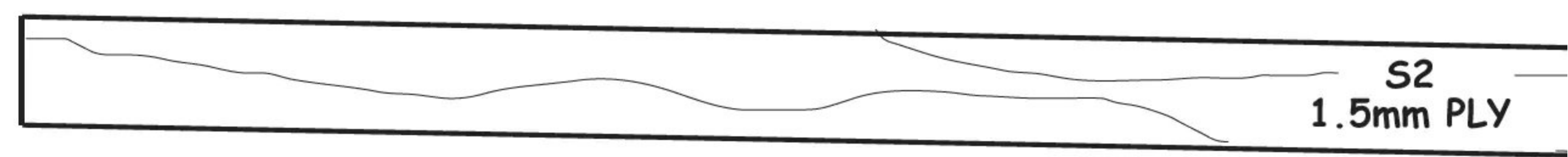
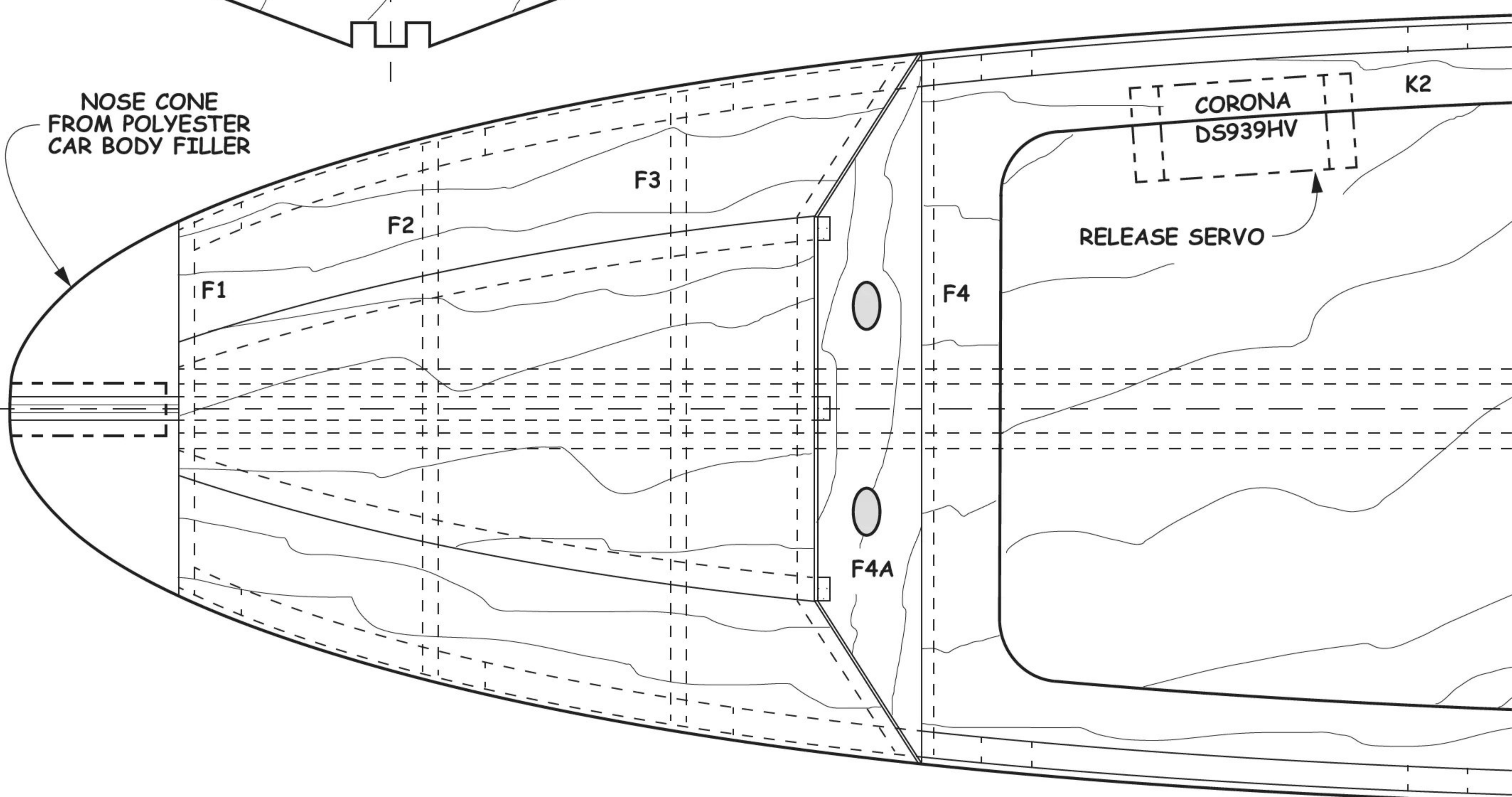
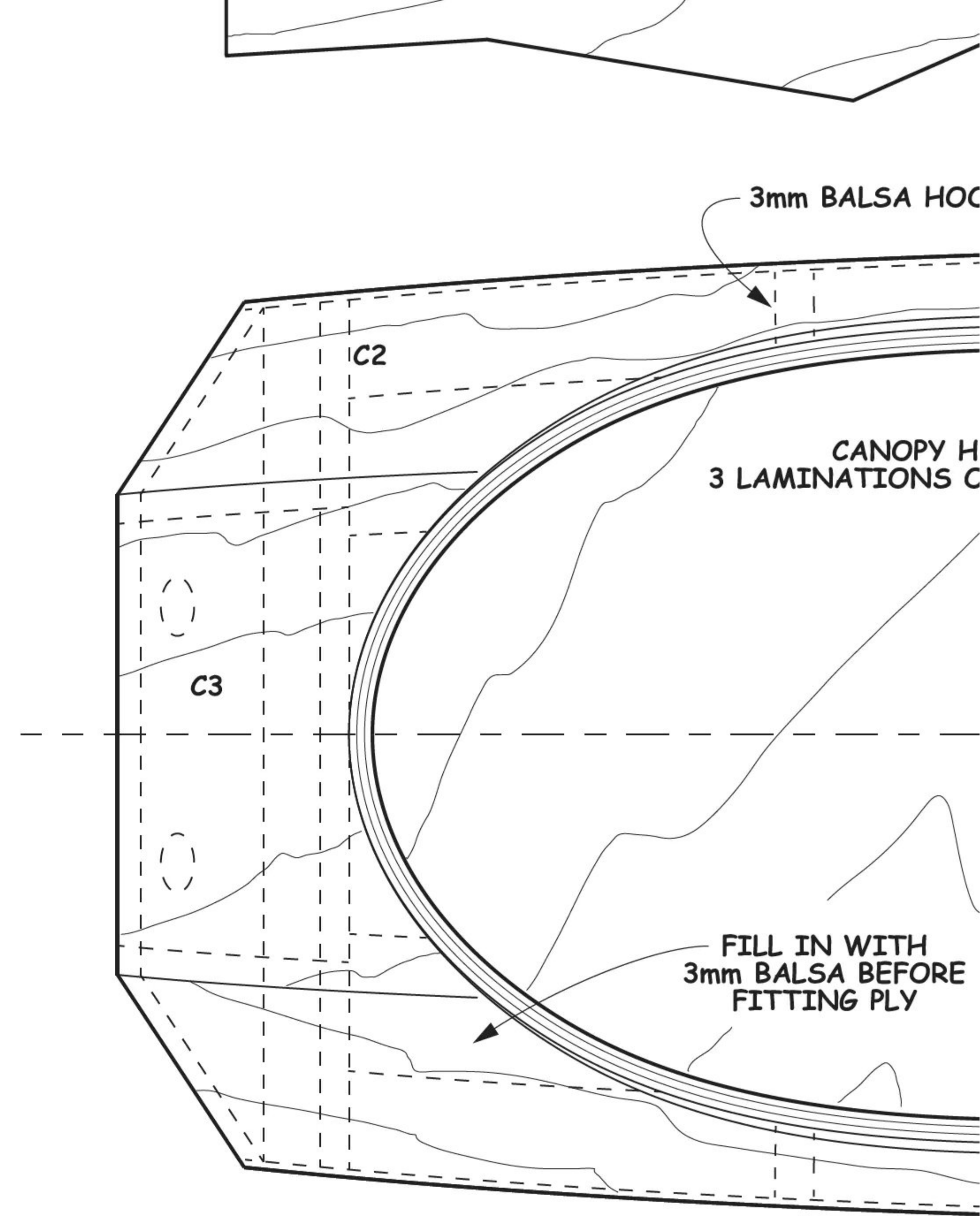
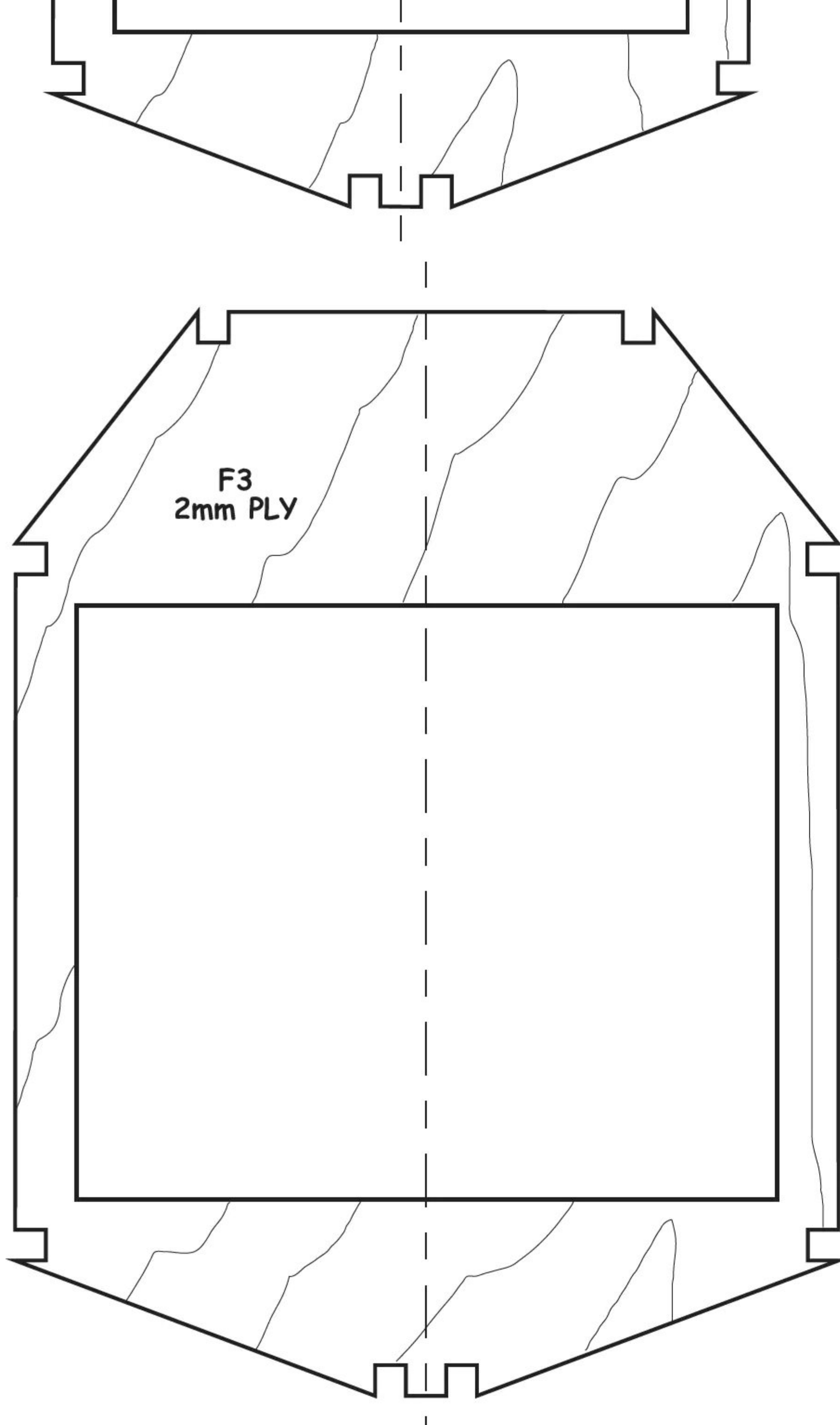


F13
3mm LITE PLY



F6A
2mm PLY





200

100

SCALE
MM

100

DP SUPPORT

LOOP
OF 0.8mm PLY

C1

F4
2mm PLY

2mm PL

REMOVE PARTS OF LOWER K3
TO FIT WHEELBOX SIDES

F5A

F5

K3

F6

F7

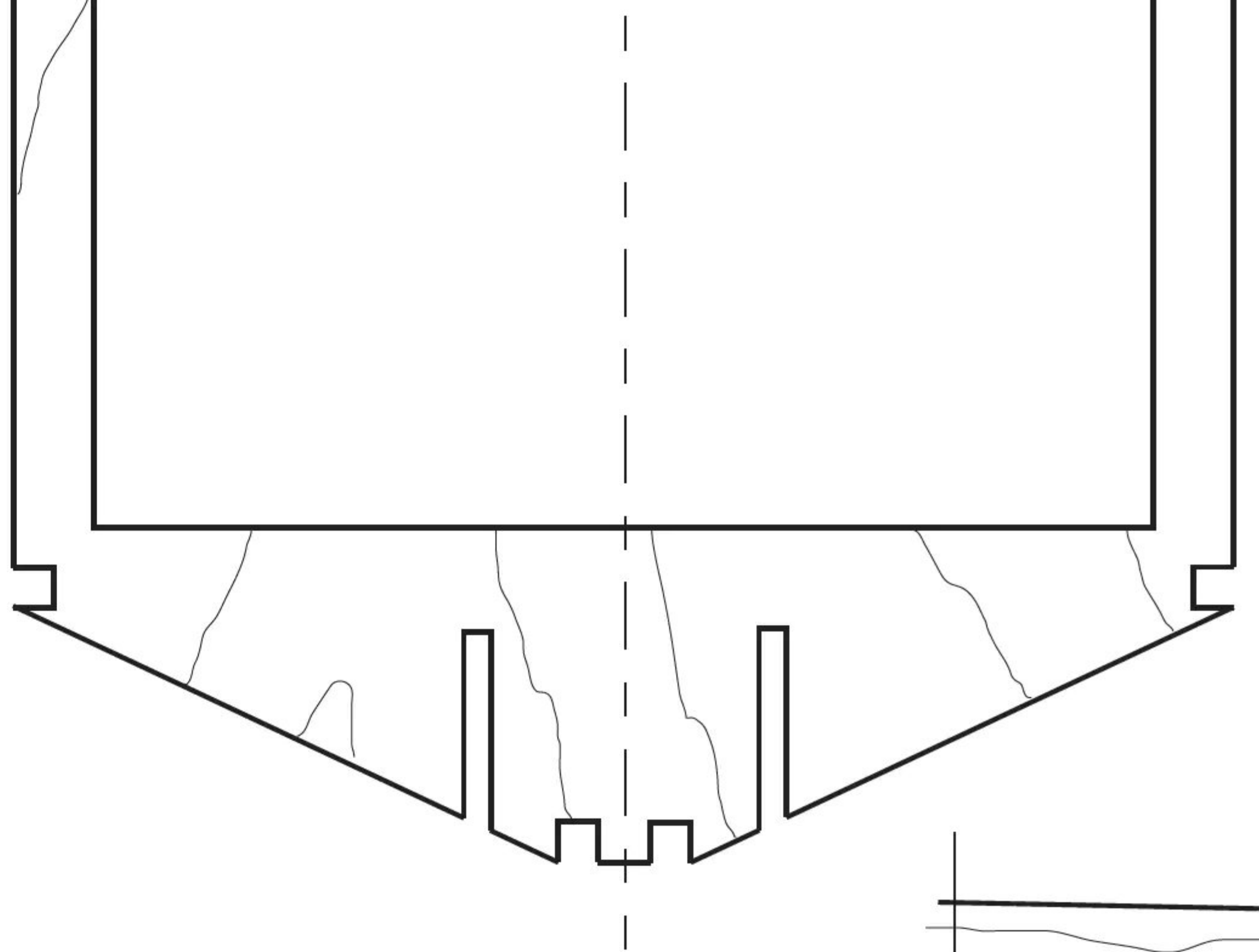
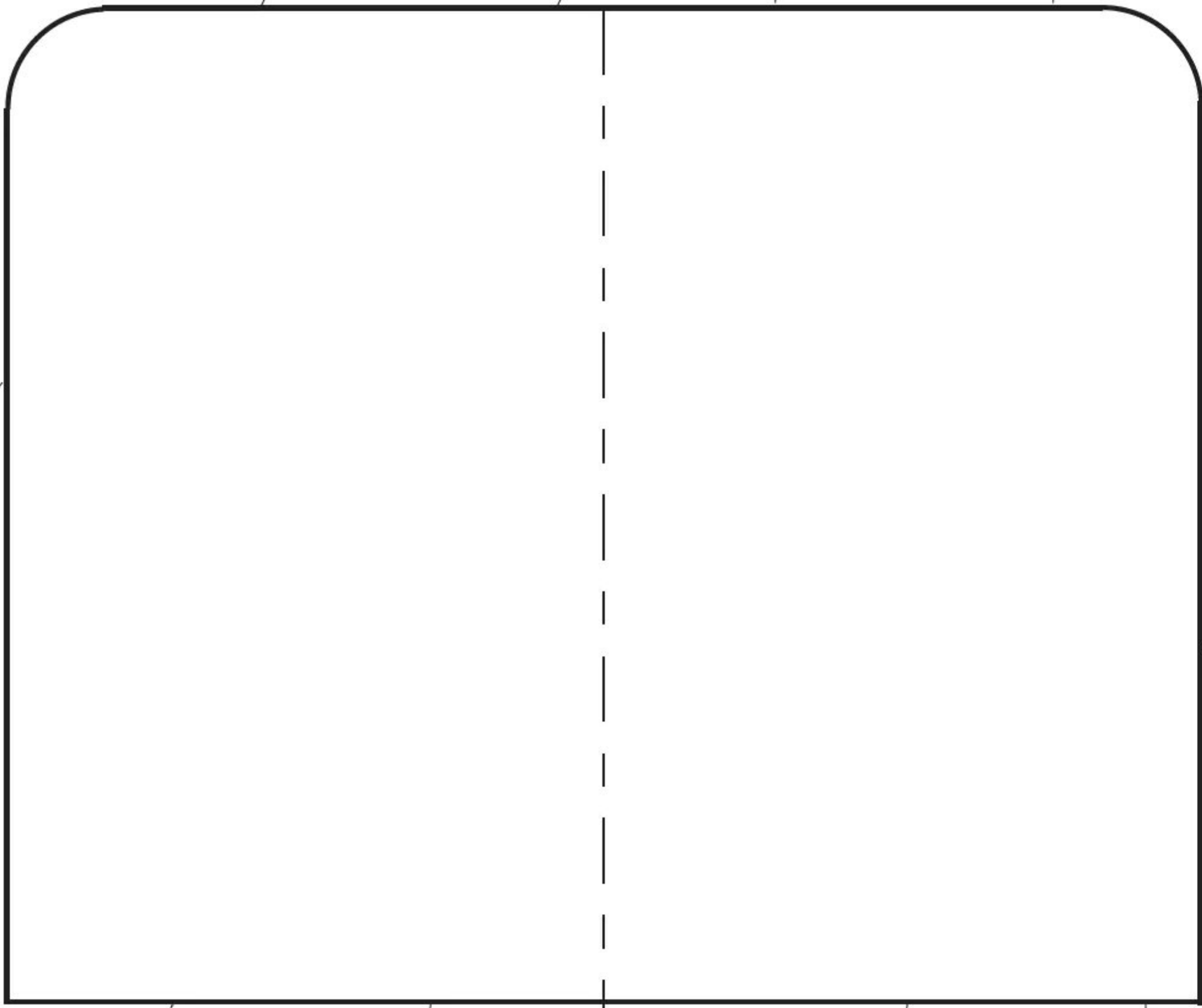
CORONA
DS939HV

CORONA
DS939HV

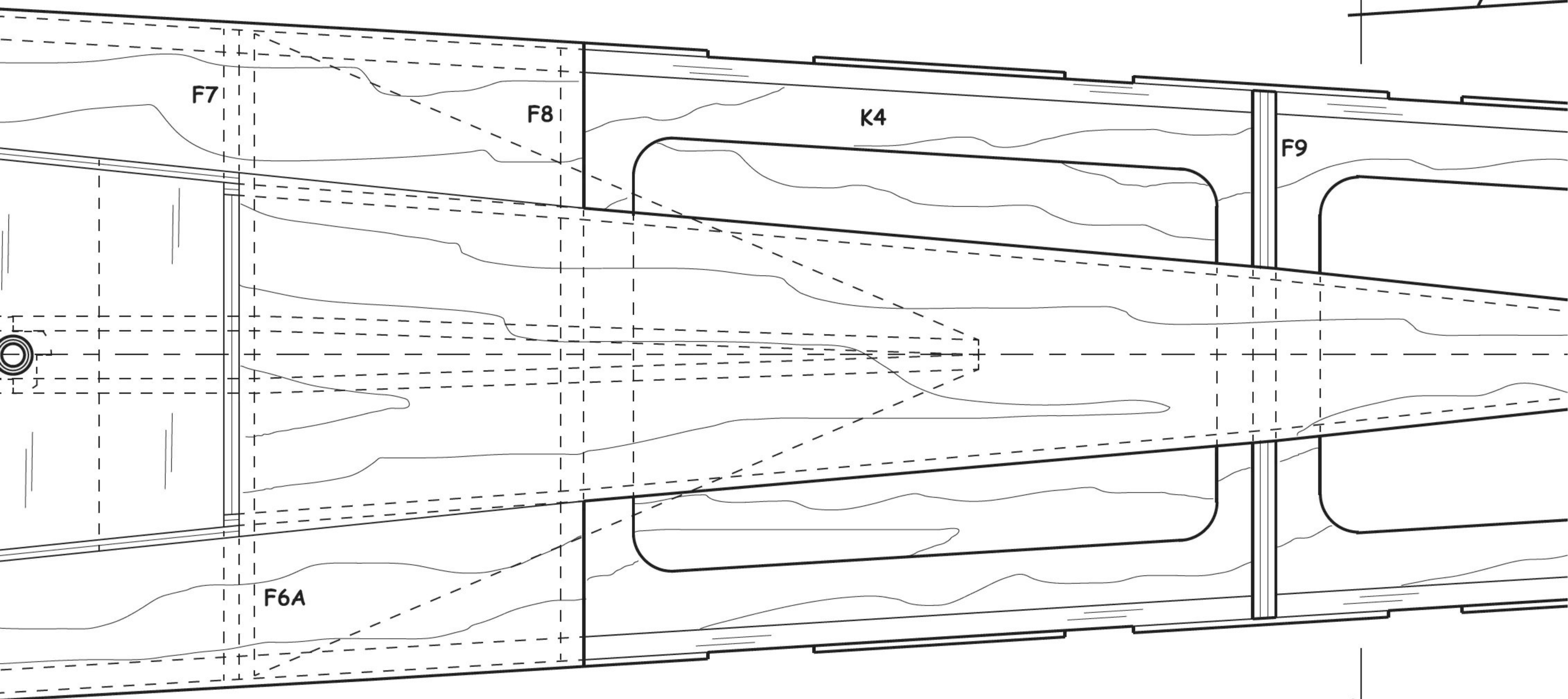
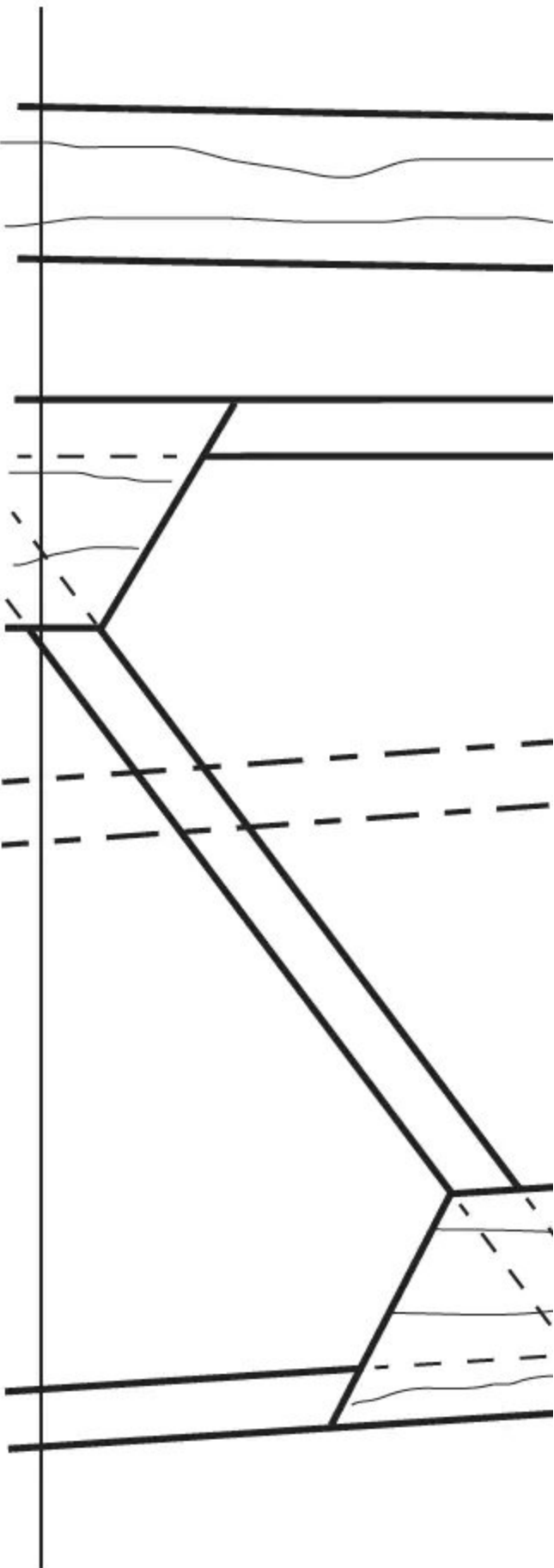
F5B

FILL IN BETWEEN WM1'S WITH 6MM BA

F5
2mm PLY



F14
3mm LITEPLY



VM1'S WITH 6MM BALSA

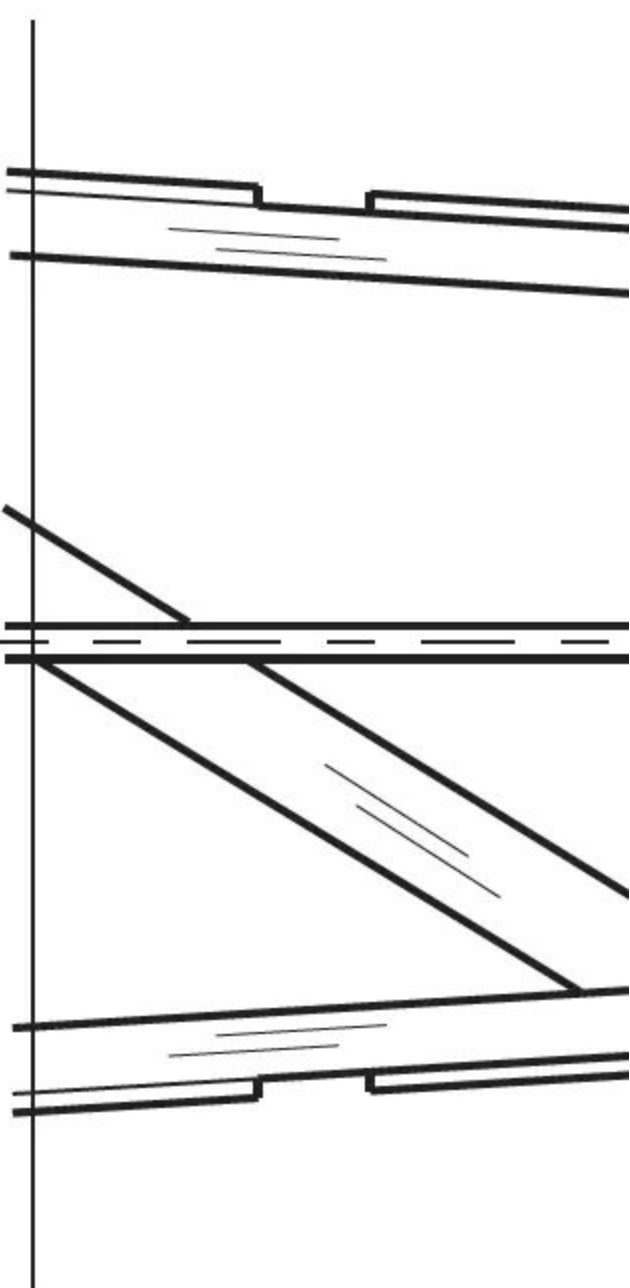


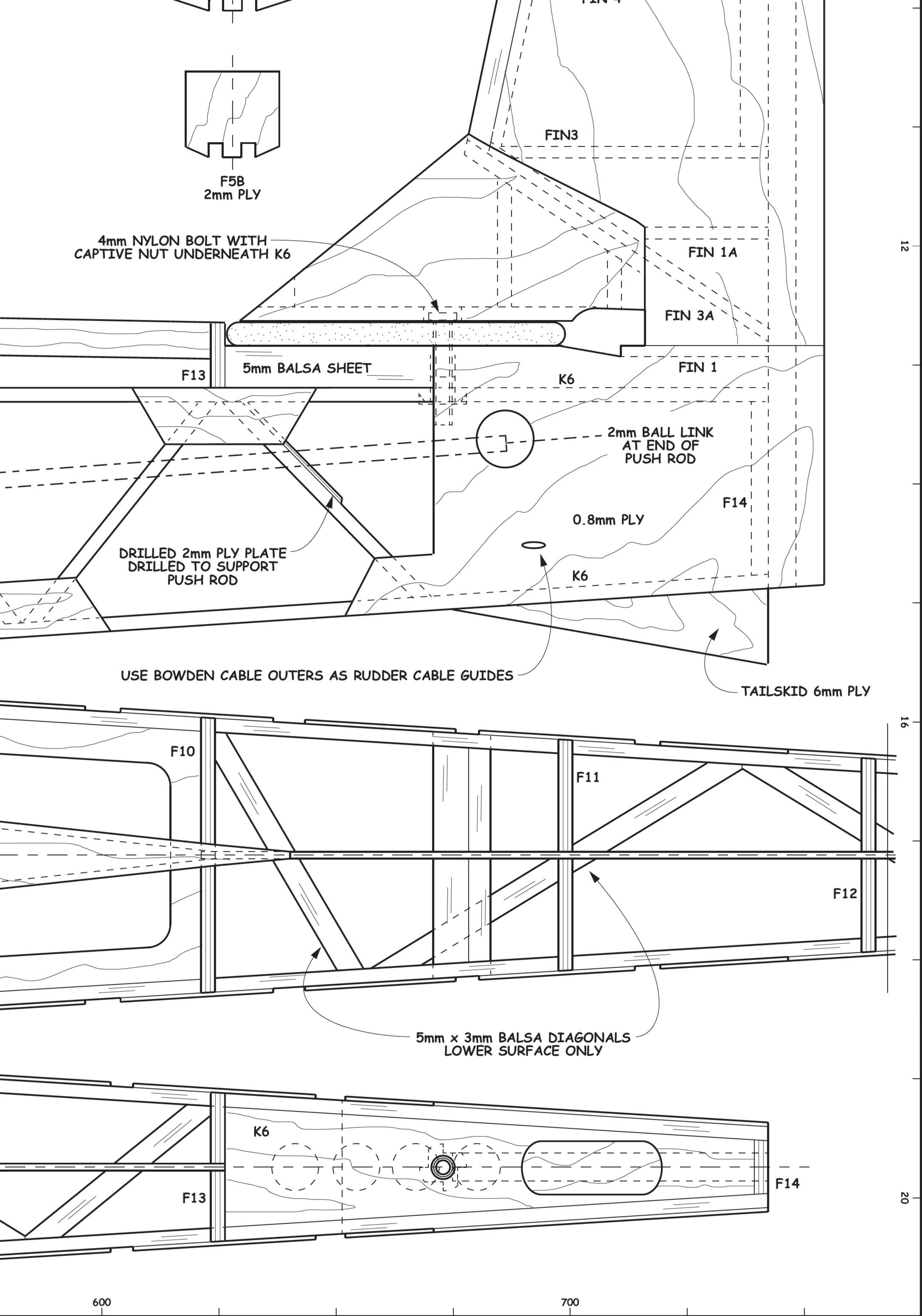
MAKE UP WING/FUSELAGE
FAIRING FROM 12mm BALSA

S1
1.5mm PLY, 2 OFF

400

500





TAILPLANE FROM 5mm HARD BALSA STRIPS

500

400

300

28

24

BATTERY TRAY
2mm PLY

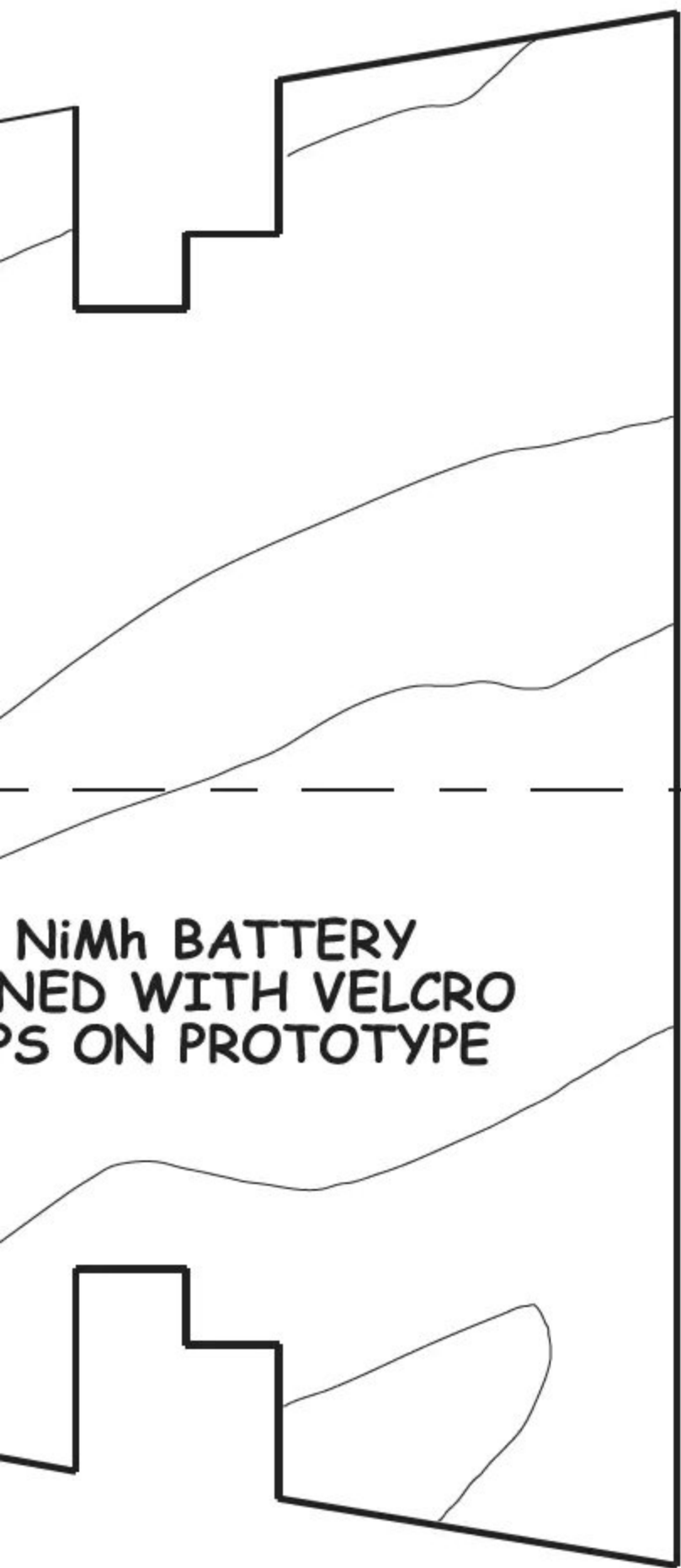
6V
RETAINING
STRIP

ELEVATOR T.E. FROM
1.5mm SPRUCE OR PLY
LAMINATED WITH 3mm
BALSA EACH SIDE

SOLID BALSA

3mm x 40mm THREADED ROD
ELEVATOR ACTUATOR

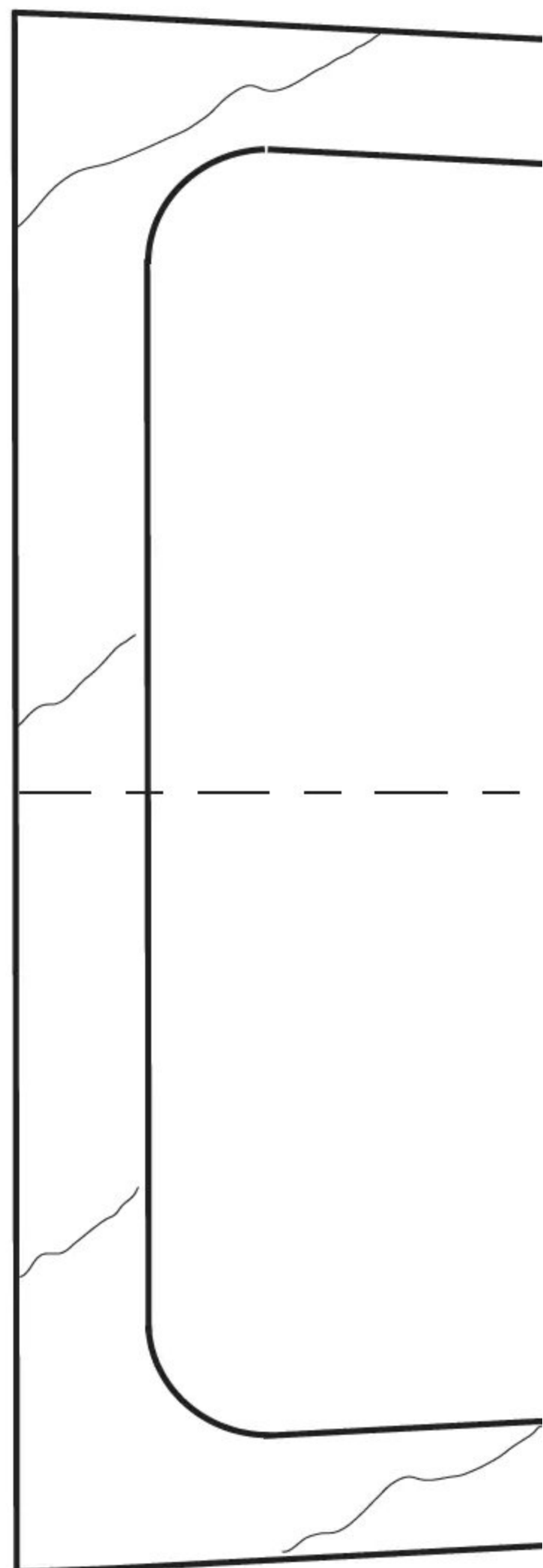
1.5mm PLY PLATE UNDERNEATH
& 0.8mm PLY ON TOP



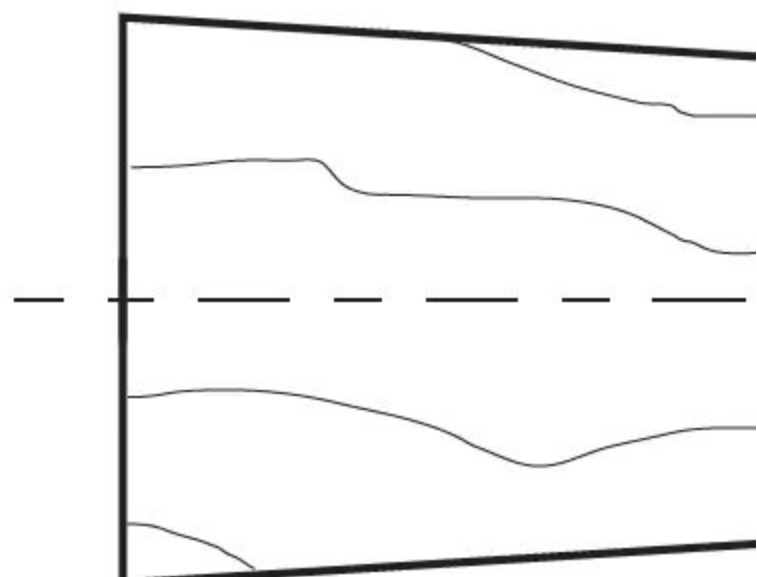
NiMh BATTERY
FIXED WITH VELCRO
STRAPS ON PROTOTYPE

SPAN:	2.28m
A.U.W:	3.5lbs (1.6kg)
WING SECTION:	CENTRE PANEL HQ35/15 OUTER PANELS TRANSITION TO 35/15
GLIDEPATH CONTROL:	AILERONS ONLY
CONTROLS:	AILERONS, RUDDER, ELEVATOR, TOW
THROWS:	ELEVATOR: 15mm UP, 8mm DOWN AILERONS: 20mm UP, 10mm DOWN RUDDER: 35mm EACH WAY C.A.R. RUDDER: 12mm EACH WAY LANDING: AILERONS UP 27mm

K1
3mm LITE PLY



K4
3mm LITE PLY

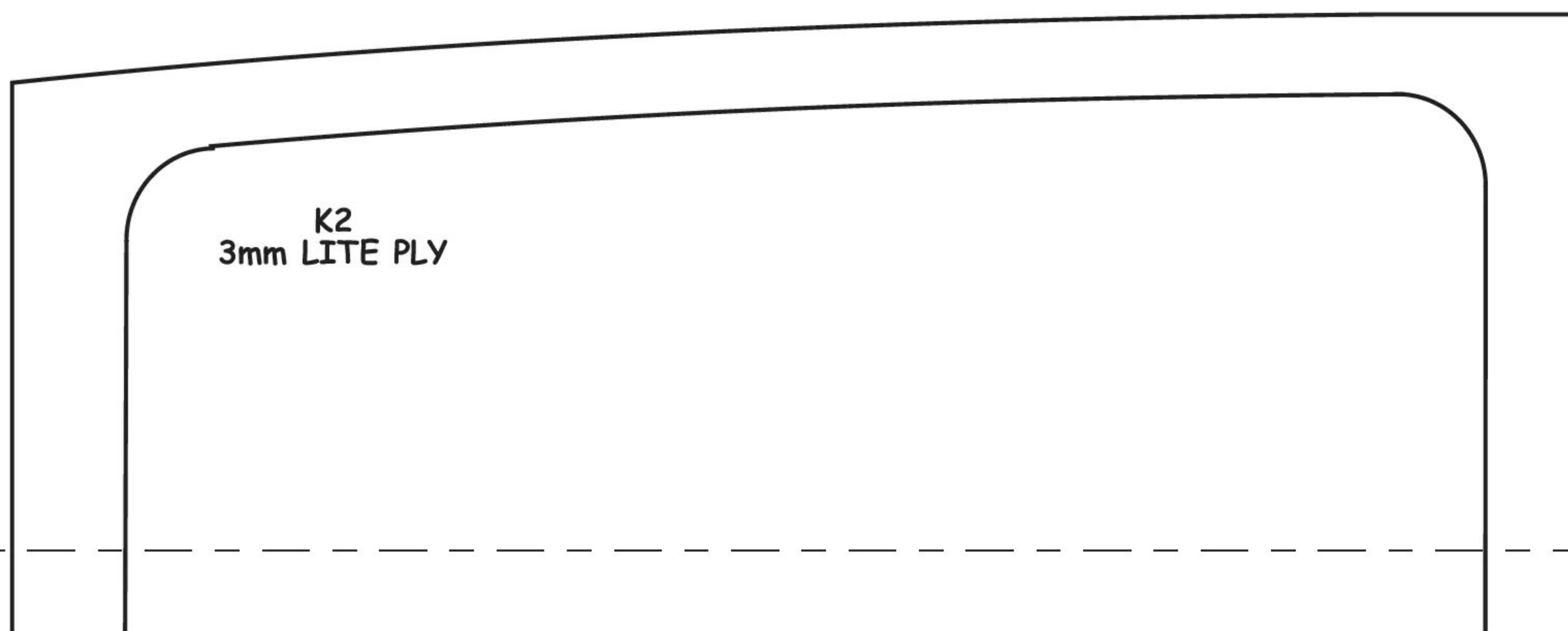
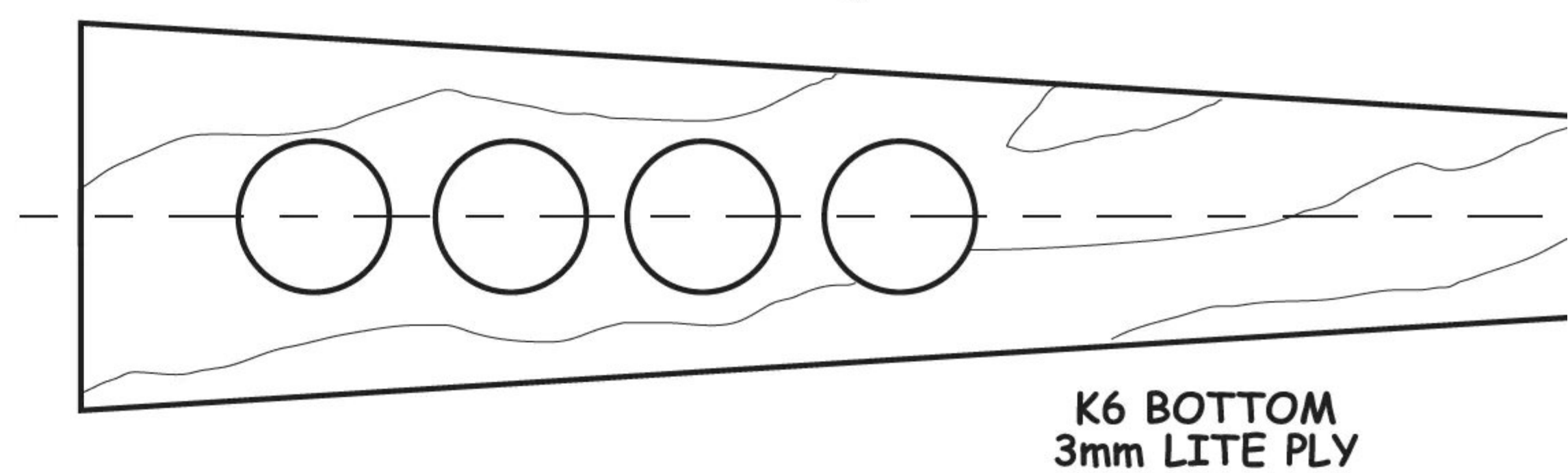
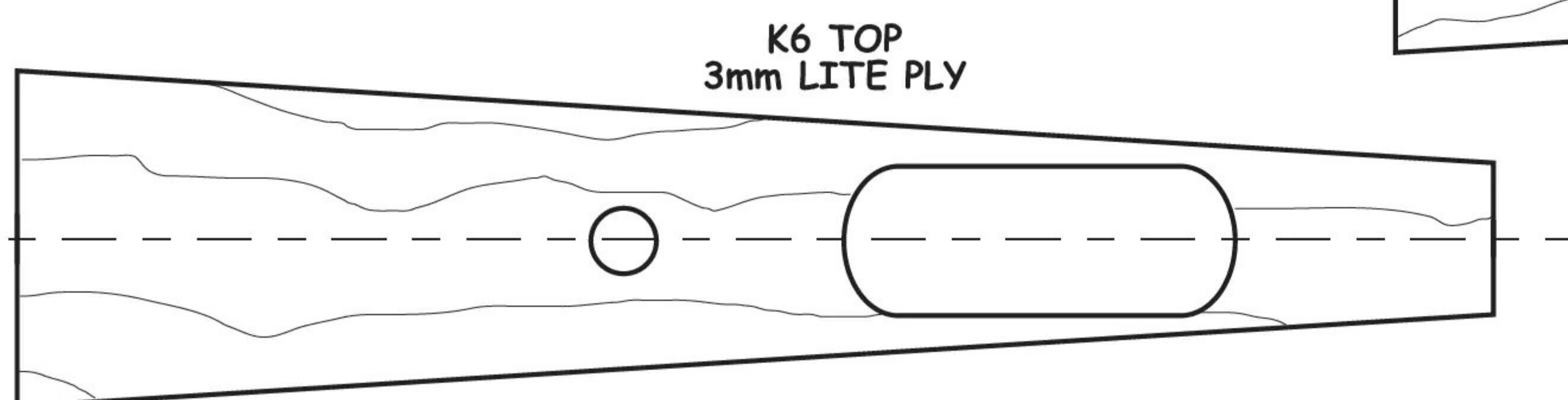
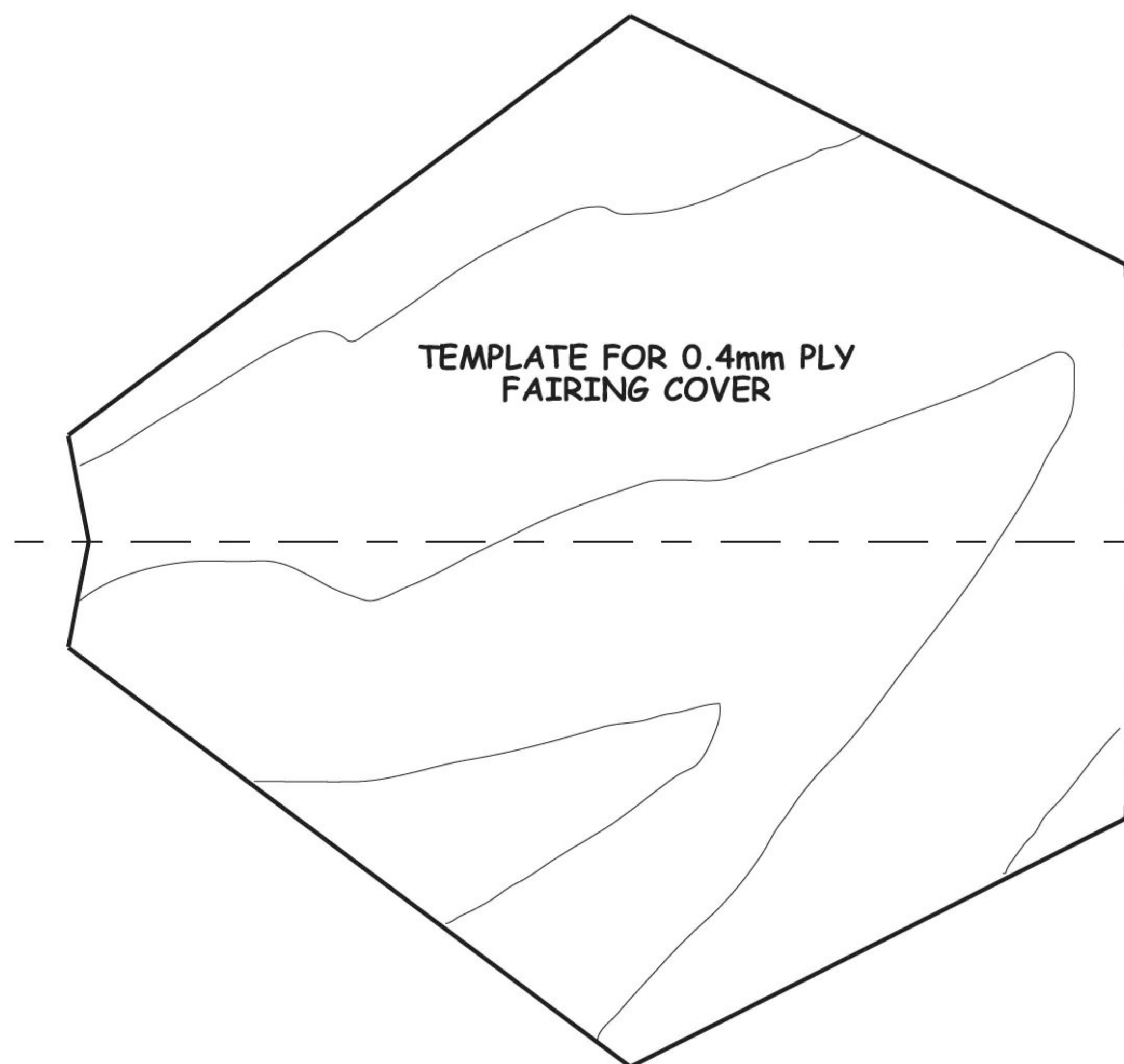
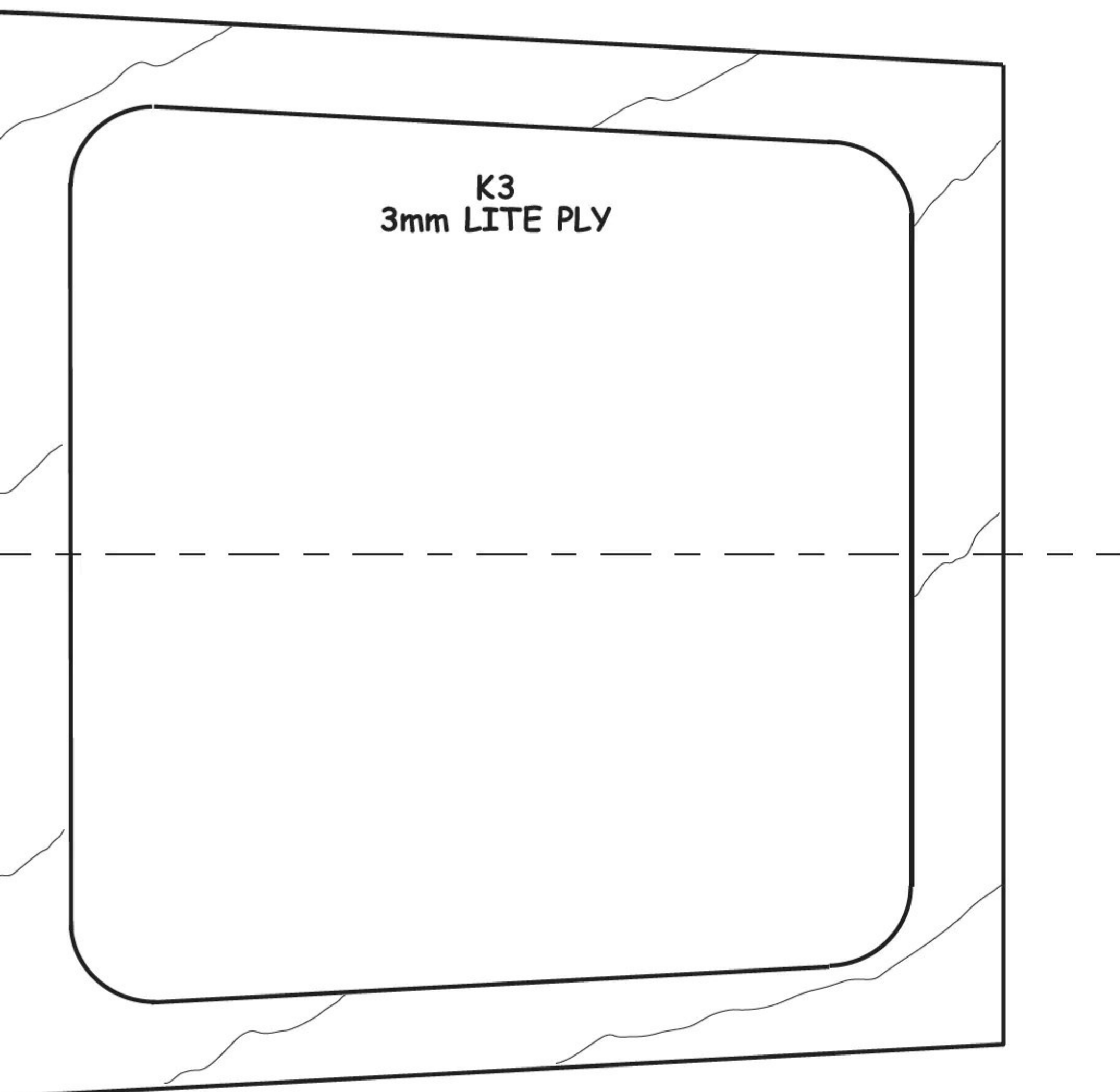
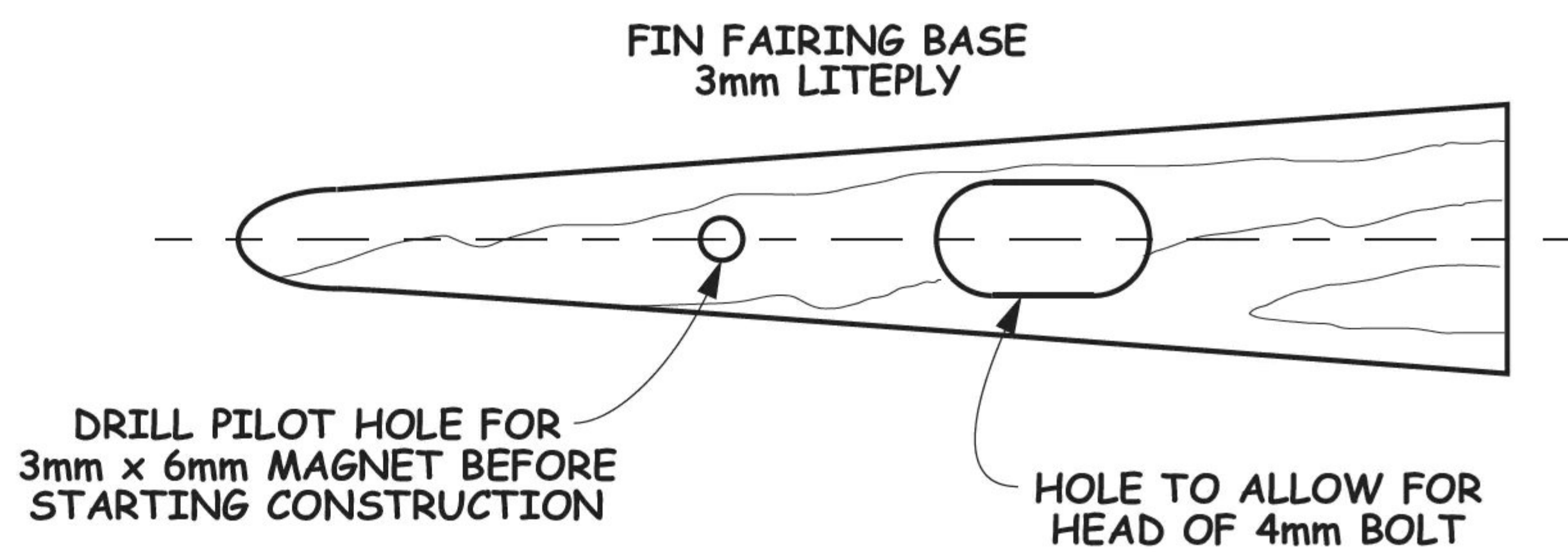


3mm

5
TION TO 35/12
EVATOR, TOW RELEASE
UP, 8mm DOWN
UP, 10mm DOWN
EACH WAY
EACH WAY
ONS UP 27mm

12

8



RCM&E

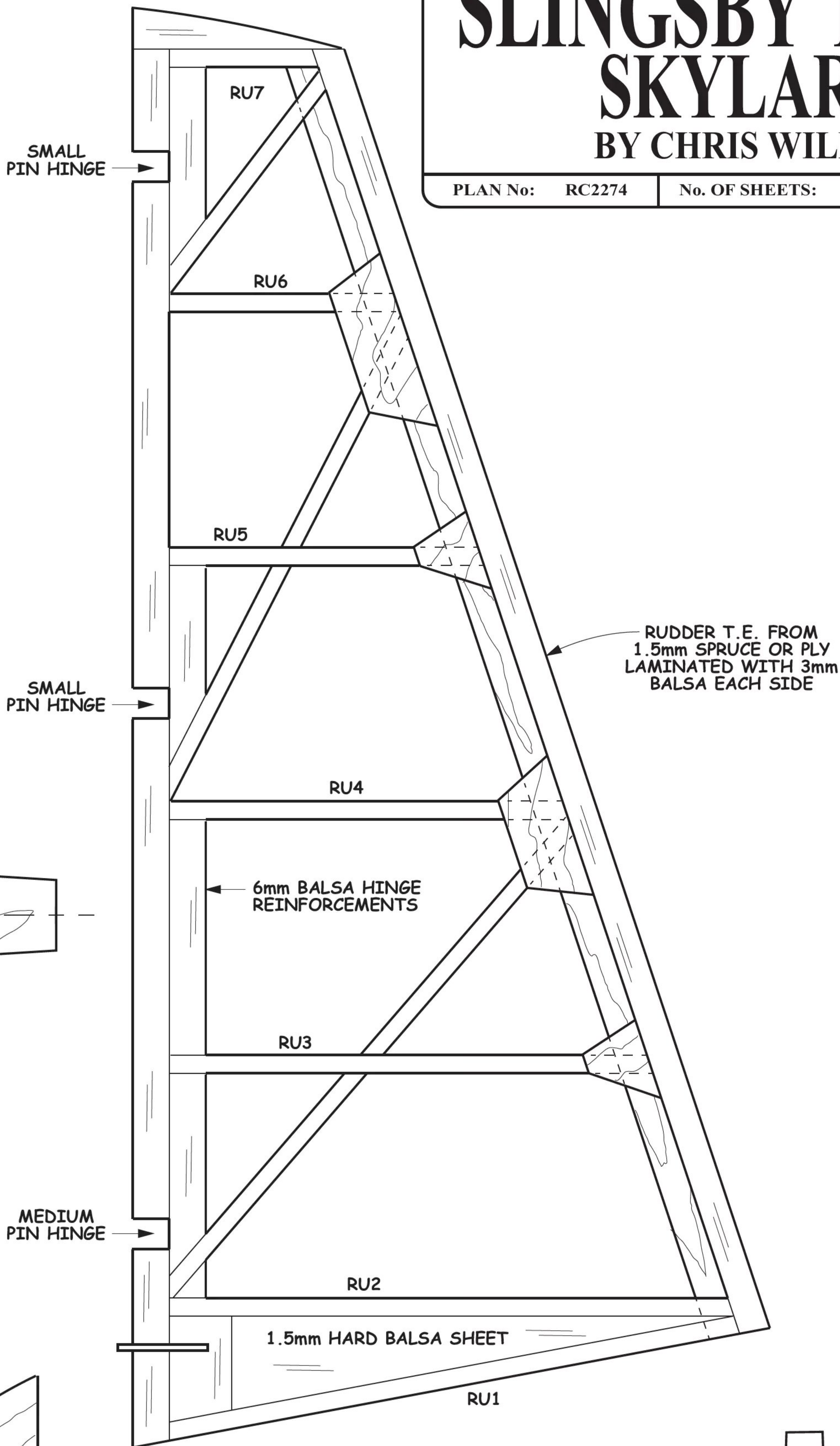
SLINGSBY TYPE 37 SKYLARK 1

BY CHRIS WILLIAMS

PLAN No: RC2274

No. OF SHEETS: 2 OF 4

First published in
RCM&E July 2025



SOLID BALSA

3mm x 40mm THREADED ROD
ELEVATOR ACTUATOR

1.5mm PLY PLATE UNDERNEATH
& 0.8mm PLY ON TOP

200

100

SCALE
MM

100

FIN

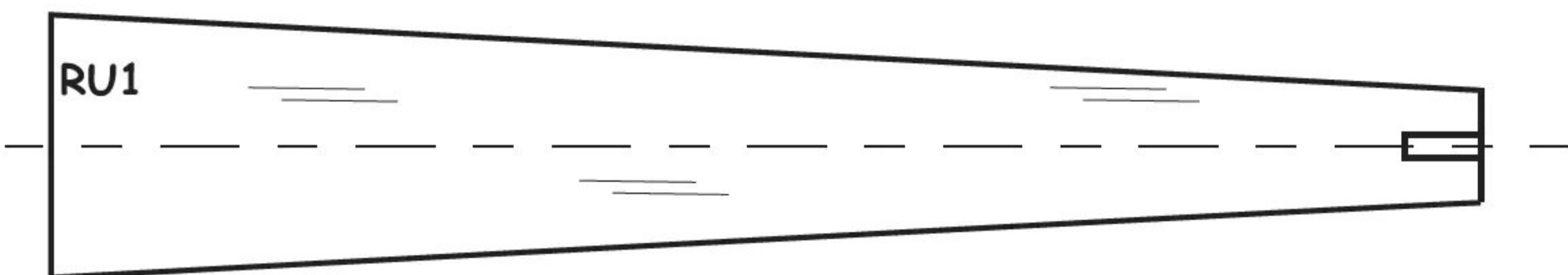
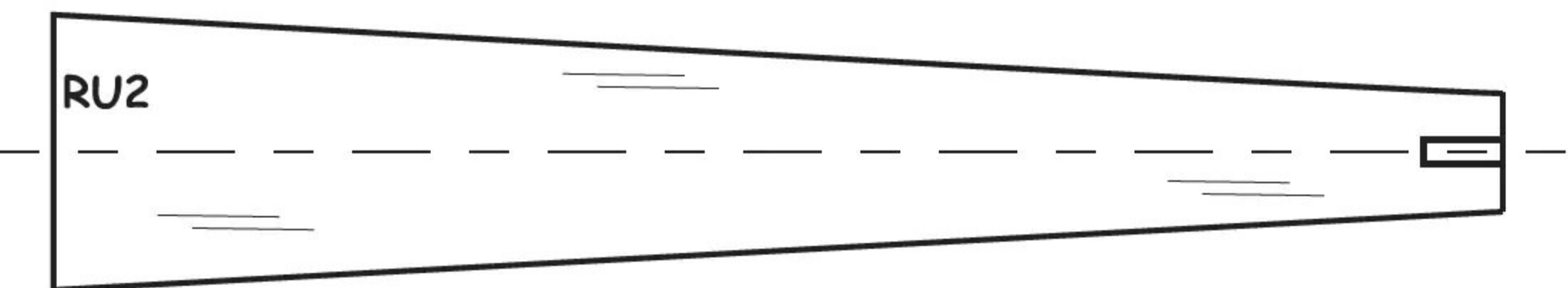
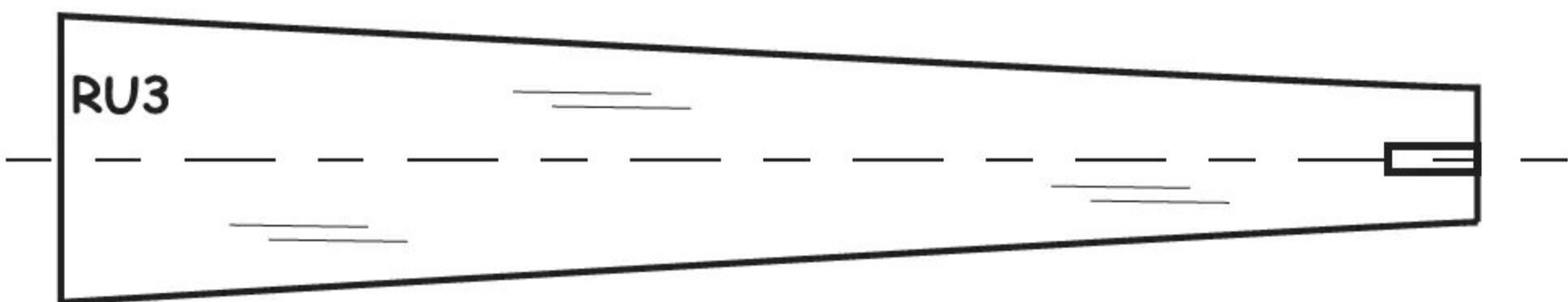
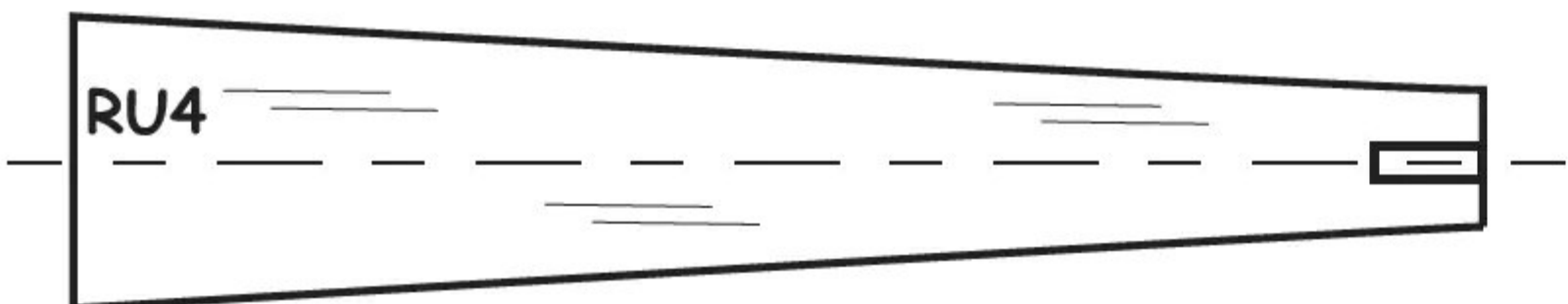
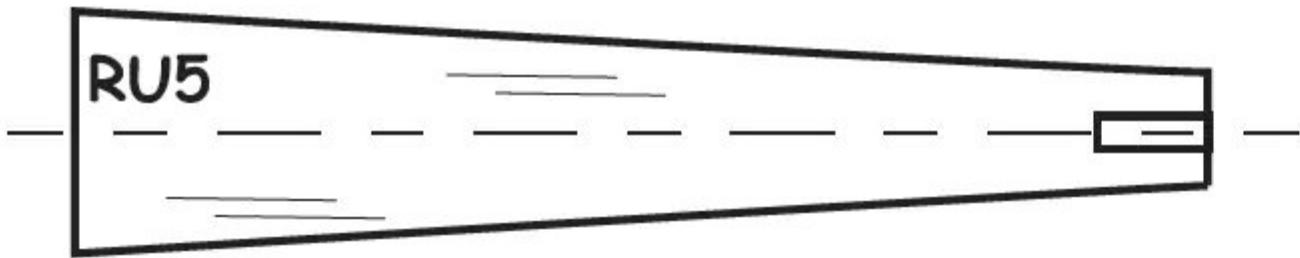
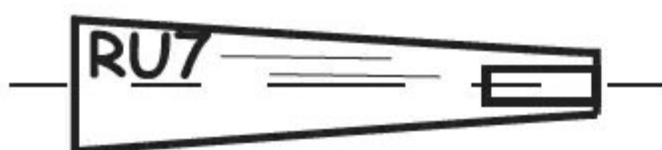
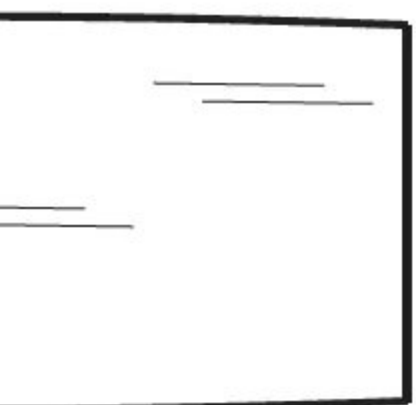
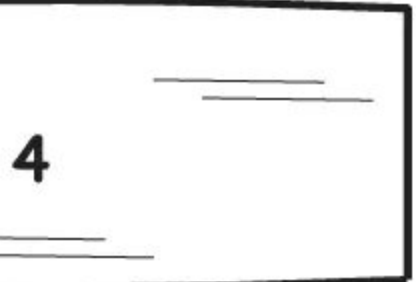
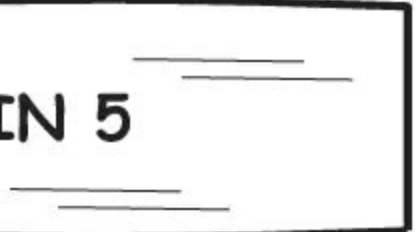
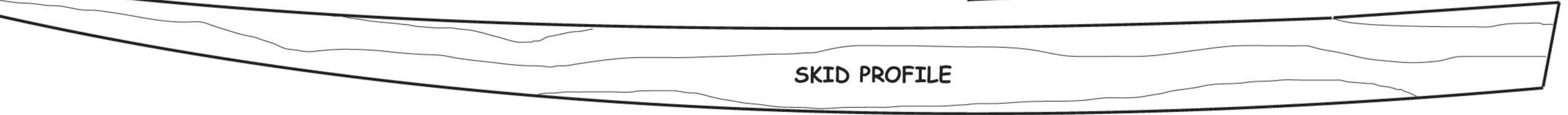
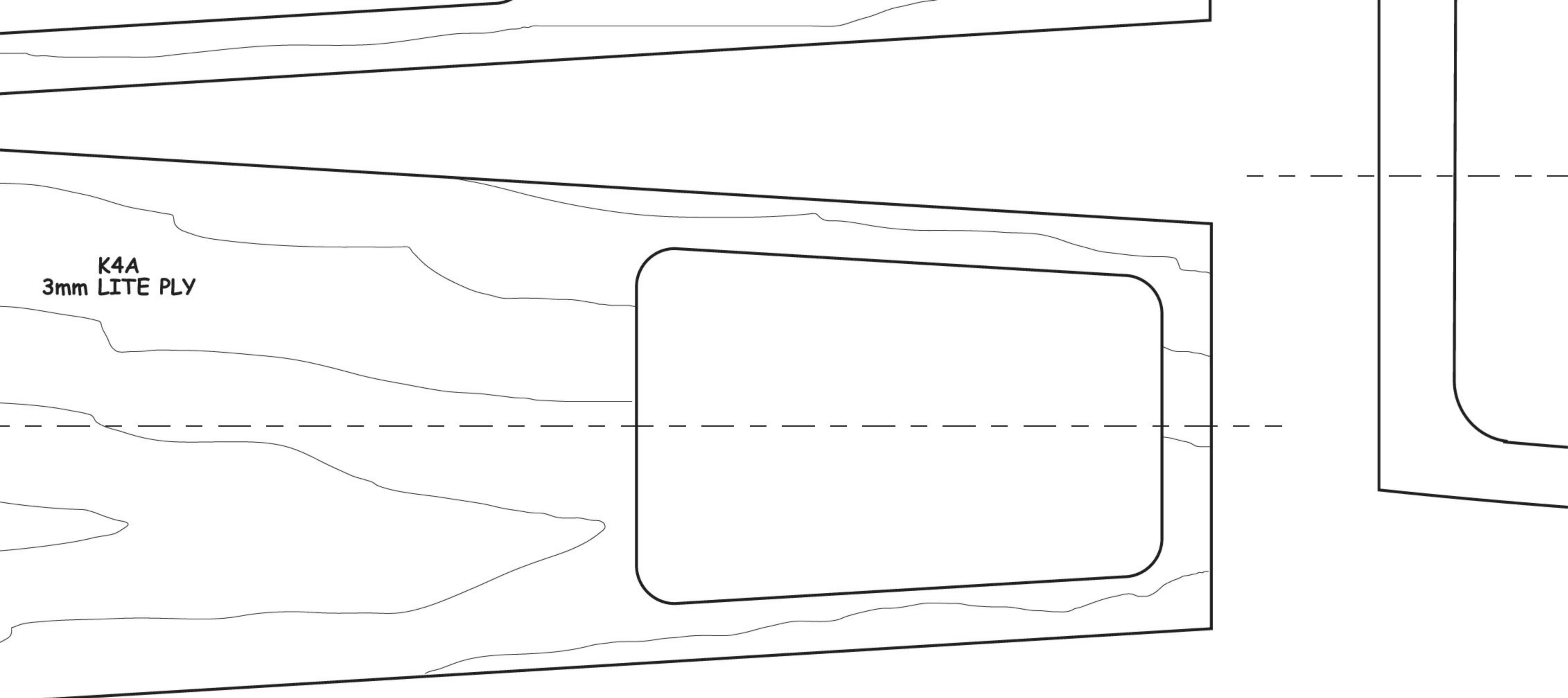
FIN

FIN3

FIN 3A

FIN 1A

FIN RIBS
2.4mm BALS.



RUDDER RIBS
3mm BALSA

