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VOL. 67 NO. 11 NOVEMBER 2024 www.modelflying.co.uk

RCM&E

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Welcome

Welcome to the November 2024 issue of RCM&E.

I have taken to protecting my LiPo connectors with 3D printed caps to prevent any unintended short circuits. After one flying session, I couldn't find a missing cap, but I didn't worry as I had plenty of replacements back at home.

That same day I heard a mysterious crunch when closing my car's tailgate after extracting my models at the flying field. I didn't think much more of it, being keen to get flying and it was promptly forgotten. However, on the drive home I noticed that the tailgate warning light was on, so I pulled over to investigate but the door was shut nice and tight. Back on the drive and with everything unloaded, I locked the car but when pressing the key fob all the doors stayed unlocked. The tailgate light was still on, so I guessed that was the culprit. After spraying the lock with penetrating oil and prodding the mechanism with a screwdriver I was just about to call out the breakdown service when I spotted a strange object deep inside said mechanism. Pulling it out with a pair of pliers, my lost LiPo cap revealed itself, much worse for wear after being assaulted multiple times as I bounced the tailgate open and shut. So that was what that earlier noise was!

Despite its distorted shape, offering it up to the mechanism showed that there was no easy way for it to get lodged inside – not in a month of Sundays!

Have you encountered anything similar in the hobby where that old saying can be applied. Let me know while I go and have a lie down!

Okay, it's time to take a quick look at some of the main articles in this month's magazine.

Mention Elmbridge Model Club to modellers of a certain age and they will go misty eyed when remembering the much-missed Sandown show, organised by EMC. The model show might be long gone but the club is still going great guns and recently celebrated its 50th anniversary. David Ashby joined in the birthday celebrations. Shaun Garrity is the first of our regular columnists, filling his Retro Ramblings pages with a report from the Pontefract Single Channel meeting before handing back to David Ashby (Just For Fun) who takes a look at one man's sizeable collection of own-design tailless gliders. Phil Stone follows with part three of his 'Building with Correx' article. Next, Danny Fenton, after winning silver at the control line Scale World Champs, files the first of three reports from Romania. Then it's over to Jon Harper for this month's pull-out plan feature, where he finishes off and flies his Boulton-Paul Overstrand biplane bomber. We have several show reports to bring you in this and subsequent issues, including all the action from a wet and windy Weston Park Show courtesy of Mike and Al Freeman. In Aerobatic Scene UK team member Malcolm Balfour reports from the F3A European Championships hosted in Belgium in July.

I hope you enjoy reading it all.

Happy Flying!

Kevin Crozier

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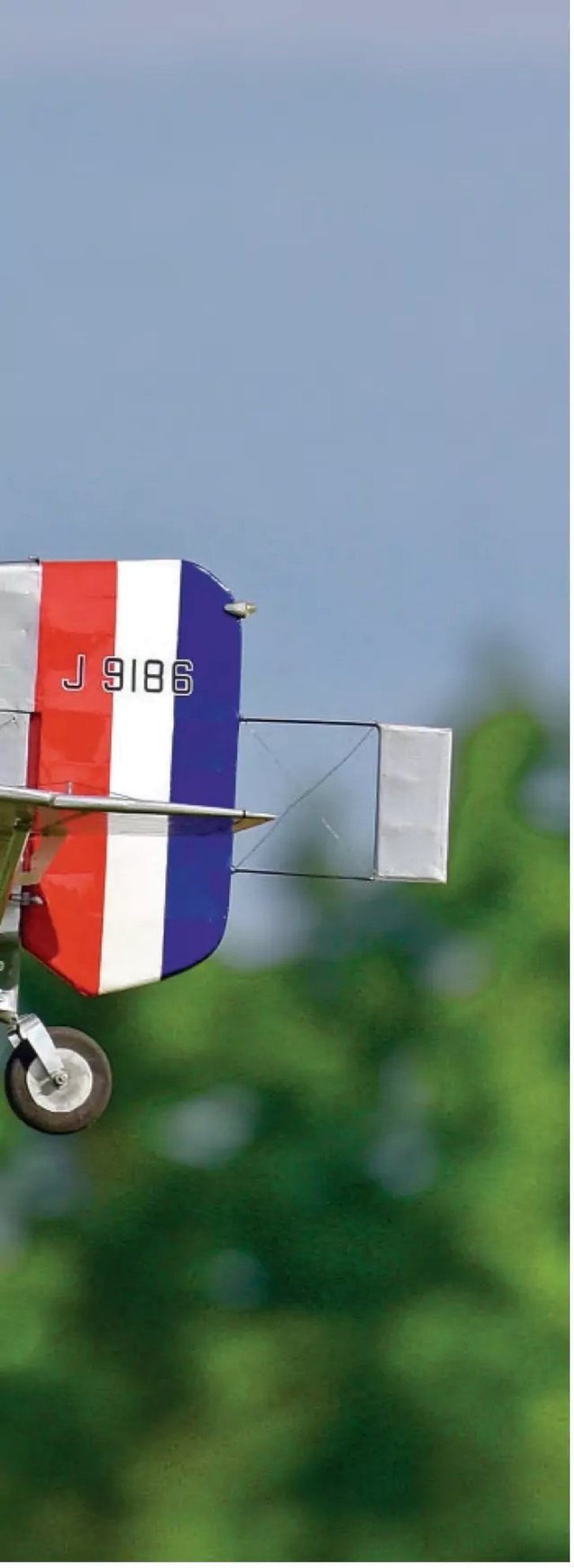
On the cover

Photo: Mike Freeman

Steve Bishop and his team have been running the Weston Park Model Show for 27 years and once again they had bagged some impressive models and pilots for this year's displays, such as Paul Metcalf's 1/6 scale English Electric Lightning, flown in style by his son Luke. This year's show was treated to weather of biblical proportions, especially on the Saturday, including wind, rain, hail and thunder. However, the sun did show up between the showers and as far as the display pilots were concerned the show must go on - and what a show it turned out to be!



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Switch on

Our latest round up of model flying news and miscellany

MOTORS & ROTORS CELEBRATES 30 YEARS

Congratulations to Dave Wilshere and his Hertfordshire based R/C model business, Motors & Rotors, which has just celebrated its 30th anniversary in August 2024. Dave writes:

Motors & Rotors was started in 1994, mainly as a model helicopter distribution company representing the Miniature Aircraft USA X-cell and Graupner Heim ranges.

Back then model helicopters were huge, before quad-copter drones shrunk the helicopter market and, ultimately, affected model shops in general. Many shops did not realise it was the helicopter market that kept them going with the constant requirement for heli spares, especially during the 3D craze.

The relationship with Graupner led to Motors & Rotors importing fixed wing models and more of the huge German company's range of accessories. The owner of Motors & Rotors, Dave Wilshere could see the change coming and diversified into specialist models and retail sales, particularly jet turbines after a meeting with the owner of JetCat engines at a Germany helicopter event in 1996.

Dave's engineering background has helped throughout M&R's history when working with the companies he has imported from. Motors & Rotors were the first importers of many brands starting with SAB helicopter blades and Zimmermann exhausts in the 1990s, through Powerbox-Systems and CARF-Models in the early 2000s.

Dave is unique in his experience of rotary and fixed wing models when flying at the highest level, representing Great Britain in both disciplines.

2024 sees another change for Motors & Rotors with a business move after 17 years in Unit 11 to Unit 9, Kingley Park in Kings Langley. The move is a whole 50 metres, much easier than the company's previous move from Watford!

Motor & Rotor's new address will be Unit 9, Kingley Park, Station Road, Kings Langley, Herts, WD4 8GW. Tel: 01923 270405. **http://www.motorsandrotors.com**

Dave would like to state that he does not promote online sales, preferring to communicate directly with his customers.

DELUXE MATERIALS PHOTO ETCH GLUE

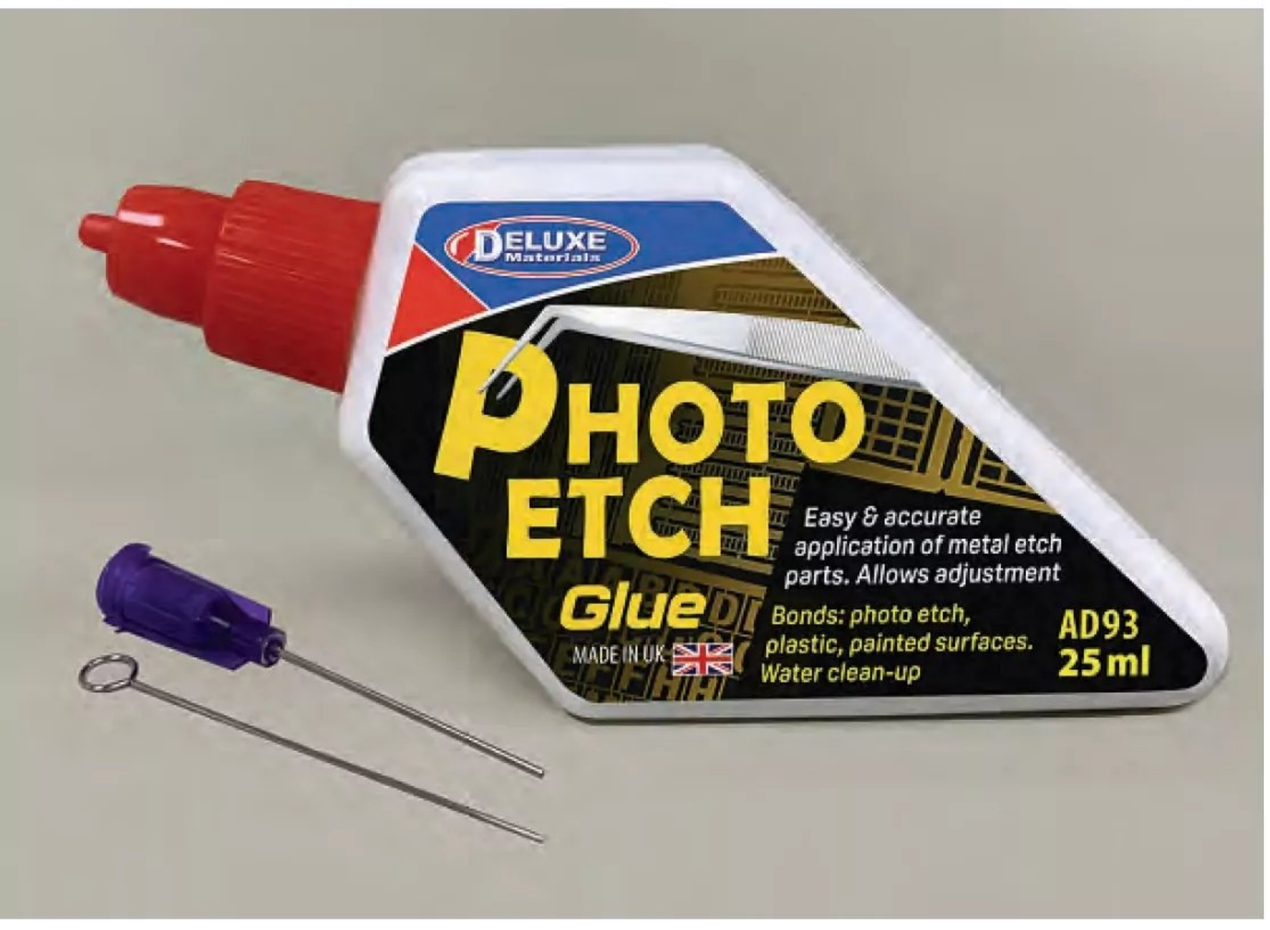
Photo etching is a manufacturing process used to produce precision metal parts and components. It is commonly used for adding fine scale details to plastic models, but you may find photo etched parts used to add small and intricate scale details to R/C models, especially when detailing a cockpit for, say, a modern jet aircraft. This technique involves using chemicals and light-sensitive materials to selectively remove material from a metal sheet, leaving behind finely detailed parts.

The only issue with this technique is that attaching the intricate metal parts can be a bit tricky. If you ever find that you need to attach a photo etched part to a model, then Deluxe Materials now have a specially produced adhesive for it in their wide range of modelling glues.

Photo Etch Glue 25ml AD93 enables easy and accurate application of metal etch parts. It is water based, is easily spread, non-brittle and for bonding all types of photo etch to plastic and metal.

Photo Etch Glue has several advantages over cyano glue as it has a long shelf life, allows for adjustment and can be cleaned up using water.

A 25 ml bottle of Deluxe Materials Photo Etch Glue AD93 retails at £8.00 and is distributed to all good model stores in the UK by Ripmax Ltd. Tel: 020 8282 7500 or visit **www.2ripmax.net**



FUTABA ADDITIONS

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Please visit the Futaba pages at the J. Perkins website for more details of this and other Futaba products: **www.jperkins.com**

F-18 HORNET

Hot on the heels of the F-22 featured last month, Barry Stevens assembles the next plane in the XFly-Model range of twin 40 mm EDF jets

Words: **Barry Stevens**

Photos: **Barry Stevens, Kevin Crozier, Barry Atkinson**

This stylish 705 mm span semi scale model of the McDonnell Douglas F/A-18 Hornet is presented hot on the heels of the XFly-Models F-22 Raptor reviewed by Steve Hannon last month. But the timeline between the release of these two models is longer than it appears as the Raptor review was held up by the wet weather last spring and strong winds and overcast conditions over the summer. But we got there in the end and so can now move on to show you XFly's newest addition to their expanding range of twin 40 mm EDF powered jets. So, let's see how Barry got on putting together this fast build kit.

When I was offered the XFly-Model F-18 Hornet to review I had to decide between two attractive colour schemes. The choice is either a Blue Angels style livery in navy blue with yellow wingtips, stabiliser tips and fin tips or the grey 'Hawks' scheme of a US Navy carrier jet. Either would have been welcome by me but it was suggested that in-flight photography might be a tad easier if we went for the Blue Angels version. Having been party to the editor's

XFly's F-18 is small but perfectly formed!

Make sure to align the stab locking screws with the flats on the pivot shafts.

Be sure to add the white plastic thrust washer when fitting the nose leg.

Each all-flying stabiliser is operated by its own servo.

frustrations over waiting for good conditions in which to capture the F-22, I was more than happy to assemble the blue model.

OPEN THE BOX

Previous reviews of XFly kits have lauded the presentation and packaging from this relatively new manufacturer of foam ARTF kits and this one is no exception, so I won't dwell on these attributes, apart from giving my own 'thumbs up' to the unboxing experience.

This is a kit of few parts, dominated by the impressive one-piece fuselage which comes fitted with large vertical fins. The CML website claims an assembly time of just 15 minutes, aided by clear instructions in the English half of the bi-lingual manual. And while I didn't time my build it couldn't have been far off this, it just requiring the carbon wing tube to be inserted in the body, followed by each wing panel and securing each with a pair of hex-headed 3 mm countersunk screws. The all-flying tail halves are added next, pushing each onto a rotating shaft before locking in place with a pan headed 3 mm screw. Flats on each shaft mean that the stabilisers can't come off – provided you take the trouble to line them up with the screw holes, of course! The stabilisers are each controlled by a separate servo and care needs to be taken to set the pushrods up so that both stabs assume the same neutral position, which is marked by a moulding line just under the front root of each tailplane. However, while one of these lines was nice and crisp the one on the other side was a little more difficult to see so I ended up using my squinted Mk.1 eyeball to check that both were equally lined up.

Aileron neutrals are easily adjusted by tweaking the U bends in the wire pushrods.

GEAR ON

Having noted the comments in the reviews of both the XFly Twinliner and the F-22 about the small wheels needing a smooth surface to take-off from I resolved to hand launch the F-18. Besides, being a sleek fighter, it would look better in the air without dragging any dangling wheels around. I therefore only fitted the wheels so that Kevin could take ground shots of the model before its first flight.

However, if you do decide to fit the undercarriage permanently then you will find it's an easy task, starting by dropping the nose leg into its hole near the nose, not forgetting to add the plastic thrust washer. The end of the leg protrudes into the Rx / LiPo bay a short distance from the factory fitted steering servo where it is locked in place with the rear of a pair of well-designed steering arms, the front one of which is already screwed to the servo. The two arms engage to provide the nose wheel steering.

Further back, the two main undercarriage legs, complete with nicely made wheels, click into matching slots on the underside of the fuselage.

SETTING UP

Assembly of the F-18 is completed by the addition of the nose cone, which is held in place by a strong magnet. This should pop off in the event of an unplanned, nose first arrival.

Some strips of strong 'hook & loop' tape are supplied with which to fix a receiver in front of the nose wheel steering servo, with a longer strip added behind to retain a 4S 1300-2600

Main legs are a push fit in their slots in the belly of the plane. They can be easily removed for flying without the undercarriage.

Nose cone is held in place with a strong magnet, allowing it to pop off if it makes contact with the ground when landing.

Inside the battery bay, also showing the Rx and steering servo locations.

The one-piece canopy has a neatly moulded interior complete with jet style pilot.

Back end of the Hornet showing its distinctive twin fins, large all-moving stabilisers and the well-detailed mock afterburners

mAH LiPo. I used a Voltz 4S 2200 mAh pack to power this model.

After checking the CG position was correct, moving the LiPo backwards to do so, it was time to check that the controls were moving in the correct directions and to set up the throws as per the manual. In my experience most manuals these days provide a pretty good starting point regarding control throws and a safe CG for a maiden flight, so I was happy to set them up accordingly. Great care was taken to ensure that the stabilisers were moving equally on both sides as I didn't want them to be giving any unwanted taileron effect.

With the ESCs calibrated to my transmitter's throttle range, as per the instructions, and with failsafe checked the model was put away, leaving a note in the cockpit to perform a range check before its first flight.

F-18 Hornet is a good-looking jet from whichever angle you look at it.

WONKY WINDER

I have a bit of a bad habit of leaving assembled models resting on their noses and one wing tip. If they are made from foam and have a removeable nose, then I will take that off to prevent it crushing on one side. But what I hadn't spotted was that the F-18 features integral Sidewinder style missiles on each wingtip, each of which has no internal bracing. So, when I returned a few days later the missile that had been resting on the floor was as bent as a banana! Despite my best efforts it couldn't be teased back into its original position, although I got pretty close, so I had to resort to pushing a cocktail stick deep inside, along its length, to realign it. I now store this model on its nose, without the cone.

JOINING THE BLUE ANGELS

Unfortunately, I was unable to make it on the appointed day for the F-18's photography and first flights so I reluctantly handed it back to the editor to for the next phase of this review...

After giving the Hornet a thorough check over, it was time to perform a range test. With no problems in that department the F-18 was pointed into the brisk wind, slightly nose up and given a firm, straight launch by my clubmate Rob. The belly of this model is a bit too wide to grip in one hand safely when powered up for a solo hand launch, so I'd recommend collaring a reliable flying pal to give it a lob. Not knowing the trim of those large stabilisers, I asked Rob to keep things nice and level as I didn't want the Hornet to rear up as it left his hand at low airspeed. As it happens the reverse was true and the model needed a few clicks of up trim, so as it got away it dipped slightly. But it wasn't anything to worry about and the Hornet was soon climbing away with plenty of power. She also dipped on launch number two but by number three Rob had decided to do his own thing and he gave it a shove that a javelin thrower would have been proud of! The Hornet didn't have a chance to dip this time, although to be fair by this stage I had it pretty well trimmed. It did need quite a few clicks of up trim but when checking the Tx later I was pleased to see that no aileron trim was required.

For the first two flights I maintained fairly low airspeeds, which were necessary in order for our other clubmate, Barry A, to have a chance to capture this small and agile fighter on camera, interspersed with a few fast passes whilst he was checking the back of his camera. At no time did the F-18 feel close to the stall and handling felt assured, even in tight turns which is usually when a model jet will exhibit its displeasure. I performed a couple of low-speed, high passes to test the model's low speed attributes and once again it gave no cause for concern, which was good to know as the time was rapidly approaching to slow her down for landing. At five minutes the Tx timer sounded so the Hornet was lined up and made a no fuss belly landing on the closely cropped grass.

With a thumbs up from Barry after checking his photos, I was free to explore the flight envelope a bit more for the third flight and this time it was made at pretty much full throttle. With the stick firewalled the Hornet

A sheet of tail numbers is supplied to allow you to personalise your F-18.

First flight! Rob gives the Hornet a firm, straight launch.

It's an easyjet to fly with no nasty surprises up its sleeve.

Closing in for a fast pass.

really looks the part, being both quick but also remarkably quiet, whoosing past with a pleasing but low-level jet sound emanating from the twin 40 mm fans. Jet style aeros are easy when she's nipping around at high speed although I much preferred using high rates on elevator. I kept the ailerons on low rates at all times, the F-18 having a good roll rate during all manoeuvres at this setting.

After three flights the XFly-Model F-18 Hornet received a well-deserved five-star rating from me. However, after checking the model over before returning it Barry S, I was a bit dismayed to see that one of the air intakes was starting to show signs of wear and tear after just a few belly landings (see the photo at the end of this review). Sorry, Barry! So, if you intend to fly her without wheels then you may want to add protective tape in this area.

ON WHEELS

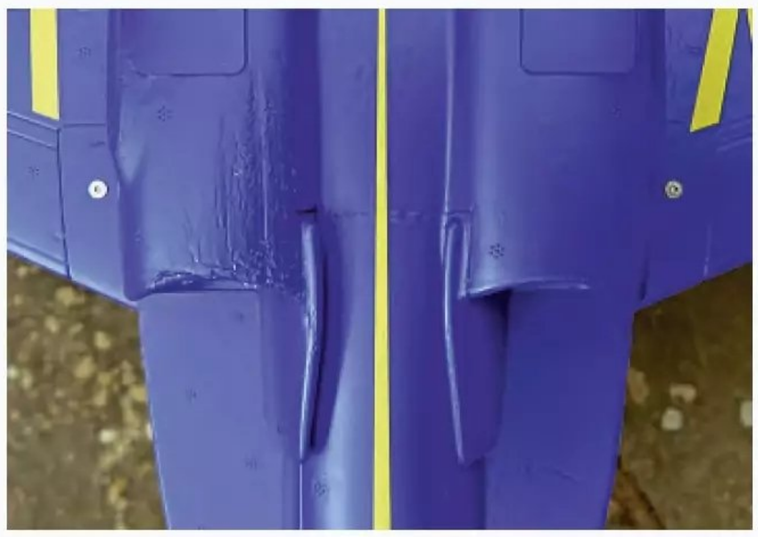
After Kevin handed the Hornet back to me, I decided to fit the wheels as my local strip is a lot less smooth than the one he flew it from, not wanting to add to the 'grass rash' on the underside. Sheep are also sometimes grazed on our patch so the wheels would help keep her clean when landing. A belly-landing slide into a fresh deposit doesn't bear think about!

Despite a few bumps our strip is closely cropped in late summer, so I decided to try some wheeled take offs. It was a bit like watching a triple jumper at an athletics meeting but after

Peeling away to show off the underside artwork.

DATAFILE

Model:	Twin 40 mm F-18 EDF 705 mm jet
Model type:	ARTF semi-scale fighter
Manufacturer:	XFly-Model
UK importer:	CML Distribution https://www.cmldistribution.co.uk
RRP:	£169.99
Wingspan:	705 mm (27.8”)
Length:	980 mm (38.6”)
Wing loading:	82 g/dm²
Wing area:	11.5 dm² (178.2 in2)
Motor size:	1413-KV5500 x 2
ESC:	20A x 2 EDF Size: 40 mm EDF 12-Blade x 2
Servos:	9 g x 5 Functions (servos): Ailerons, elevator, throttle, nose wheel steering
LiPo:	4S 1300 - 2600 mAh



Ouch! We’d recommend taping over the air intakes before making too many belly landings.

a hop, skip and a jump the Hornet was safely away and grooving around, just as Kevin had promised. I have enjoyed several flights with her now and I am very pleased with the way she flies.

Being so quick to build - you really could assemble this one while making a cup of tea - then it’s the perfect choice for anyone who wants to fly a small, fast jet but without having to spend hours putting it together. ■

Low and slow down the strip. Note the slightly wonky Sidewinder caused by incorrect storage.

A final look at XFly’s good looking, small, twin EDF jet.

Good company, good weather, good models and good food. The Elmbridge Club's 50th Anniversary Family Day had it all.

ELMBRIDGE AT 50

Elmbridge, the well-known Surrey model club, has just celebrated a milestone birthday. David Ashby popped along to join the party

Words & Photos **David Ashby**

I hadn't quite realised just how busy the Elmbridge Model Club (EMC) was back in the 1970s and 80s. Sure, there was the Sandown Symposium but for many years the club was also involved in the organisation of flying activities at the Pontins Model Festival at Brean Sands in Somerset. My family were regular attendees. That we endured the accommodation for which Brean became infamous was due to the friendly and well-run flying sites not far from the camp. No Elmbridge, no Pontins.

Or Sandown, of course. The full Sandown story is for another time but what struck me, reading the club's 22-page history at July's 50th Anniversary Family Day, was the sheer amount of hard graft and organisational nous required to set up and run what grew to become Europe's largest working model show. Starting in 1976, and for the next 30 years, some club members would each take up to three

Black Horse Midget Mustangs flown by Charles Smitheman and Rob Vincent.

It's another of those models you wish they still made.

"Rob got lucky when his searches led him to a shop in Luxembourg, whose last example was soon heading to Surrey"

weeks annual leave around the show weekend, such was the vast amount of time and effort required to set up and dismantle the event. Small wonder the club now boasts a fine flying field, club house and facilities.

EMC came about in 1974 when 20 members formed a multi-discipline club encompassing boats, cars and aircraft. Represented by a separate sub-committee, each genre has grown over the years, helped by the acquisition of bespoke facilities; the club has its own flying field, boating lake and car track with total membership now exceeding 220, the aircraft section accounting for 106 including nine juniors.

The flying field encompasses 51 acres, set out to the BMFA's suggested dimensions, with fields bordering the site owned by the club and let for grazing horses. The pit area has concrete pathways, there are battery

Arthur Elvin's Aeromaster Bipe on finals.

Some 40 years old and recently recovered this is Charles Smitheman's Proctor Enterprises' Antic. Designed for single channel back in the day, it now reflects the modifications and improvements he's made. The cowl metalwork is all his.

Informed commentary from Martin Painter (left) and John Tancock went down well - the lunchtime community sing-song not so much...

A leisure battery being 'tested'!

Geof Ward's marvellous P-40 came from the remains of an old Hangar 9 ARTF.

charging facilities, a bright and clean kitchen area with seating, toilets and storage for the club's mowers and training aircraft. It's a very impressive set up.

A family day is run every year as a way of getting kids, wives, sweethearts and friends together to enjoy some flying, food and drink in a relaxed setting. Trainers were on hand to give flights to anyone who'd like to try, as several did.

WALK ROUND

An early shower quickly passed, leaving brighter skies and a gentle breeze for the remainder of the day. Cars, vans and flyers arrived through the course of the morning disgorging a nice variety of models.

Rob Vincent and Charles Smitheman had lined up their Black Horse Midget Mustangs, instantly making me wish I'd had one when they caught my eye a few years ago. You'd need a miracle to find one now, although Rob got lucky when his searches led him to a shop in Luxembourg, whose last example was soon

Geof with his tweaked version of the Nijhuis 50mm EDF Gnat.

Nice cockpit detail on Geof's Gnat.

David Ebdon's Air Camper potters past.

John Simpson's Canberra cruises through some temporary murk. It flies beautifully and kits are available online.

David Ebdon (right) brought along his friend Andrew and Andrews's grandson Devon to see what model flying is all about.

heading to Surrey. Everyone stopped to watch when they flew together.

PATTERN SHIPS

A variety of bespoke aerobats graced the pits and Hairo Okanessian brought several, including a 1.4 metre span Lumina F3A ARTF that came all the way from a shop in Japan.

Appropriately, Charles was flying a Curare, the 64" design that won the 1977 World Champs. Appropriate because Curare designer and multiple World Champion Hanno Pretner flew at Sandown for many years, amazing the crowds and providing inspiration for many up-and-coming aerobatic flyers.

Charles' model is a now discontinued ARTF from German retailer Schweighofer, about 10 years old, electric powered using six cells, with Rohm-Air retracts moving the U/C legs. He mentioned that it needs to be flown in a different manner to modern F3A machines, the thin fuselage for instance means knife-edge must be flown faster, but a timeless thoroughbred it remains.

LITTLE JETS

John Simpson's EE Canberra was another head turner. The sight and sound of the twin 70 mm fans moving the 1.6 m span model around was memorable. It uses two Wemotec fans with

John Simpson with his pretty little 50mm Mirage III, his latest design. Look out for the kit in due course.

Dave Charles' Seagull Zero touches down after an impressive performance. A Saito FG-21 petrol engine pulls it along with ease.

Charles Smitheman's Curare drops the flaps for a slow pass.

Hairo Okanessian loves his pattern ships. This, his Lumina, came all the way from a shop in Japan.

You don't see a Ripmax Harmony for years then two turn up at once! This one belongs to Dave Charles'...

...and this was Charles Smitheman's re-engineered example.

3W20 motors and a 6S LiPo battery, weighs around 3.5 kg and, best of all, he kits it! Have a look at **www.englishelectricmodels.co.uk** where you can buy a twin 50 mm Canberra too, along with an EE Lightning in 50 mm and 70 mm sizes.

Although I didn't see it fly his new 50 mm Mirage III looked very sweet indeed and, along with an F-18 Hornet, should be available in due course.

Geof Ward's little 50 mm Folland Gnat, built from the Tony Nijhuis kit, was another beautifully crafted little jet. He reworked the ducting to improve the three-cell performance, then finished it with a fine 'Arrows scheme.

WARBIRDS

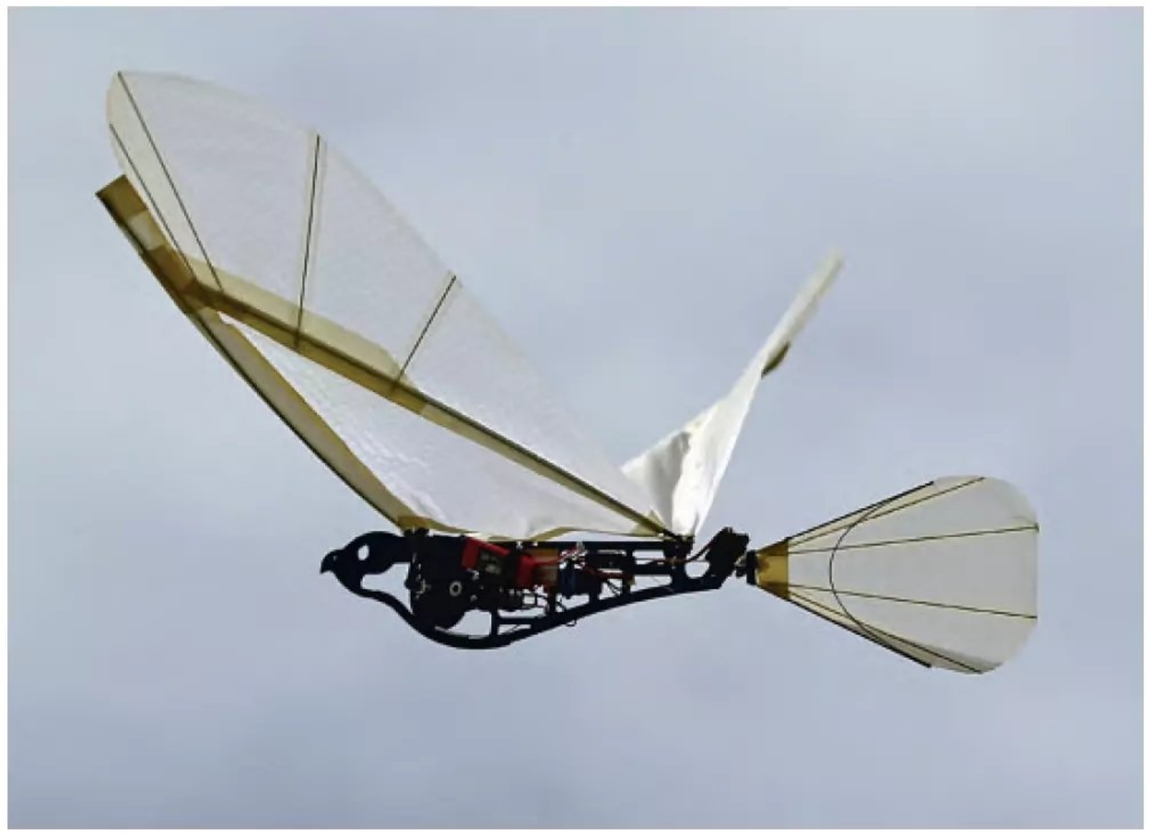
Geof admitted that he enjoys time in his workshop as much as flying, his P-40, a superb example of modelling craftsmanship, demonstrating that he makes good use of that time. It started life as a Hangar 9 60-size warbird - you know, the shiny dark green/brown one introduced back in 2005. Geof saved the bits after the model's first owner re-kitted it, took them home, rebuilt it, added flaps, recovered it,

"Hangar 9's 60-size warbirds always flew well and, perhaps with a bit of that DNA still in the balsa, this one does too"

Arthur Elvin's Pitts. I think this is the Black Horse ARTF. A Gemini twin 1.60 provides the power.

Sam Linford watches his daughter Evelin have a fly with instructor Terry Huxley. (Walter DeAth photo)

A Roesel's Bush-Cricket (I looked it up) inspects Rob Vincent's flying notes.



Rare bird. I'll tell you a bit more about this R/C Ornithopter in a future Just For Fun column.

Plenty of good honest club aerobats were in evidence such as this Wots Wot Foam-E.

sprayed a new scheme, then weathered it. The result is a stunning model. Hangar 9's 60-size warbirds always flew well and, perhaps with a bit of that DNA still in the balsa, this one does too.

TWINS

Remember Ripmax's Harmony? The long since discontinued ARTF twin is a rare beast these days, making the sight of Dave Charles and Charles Smitheman's models flying together very special.

Charles had spent a bit of time on his example by remaking the nacelles using balsa, adding flaps and recovering the model in an all-red scheme reminiscent of the DH.88 Comet. Two O.S. 52 four-stroke engines spin 10" x 10" props and, in passing, he mentioned that the harmonic problems between the engines took some time to iron out.

HAPPY DAY

If sheer variety tops all else, then you'll never beat a club event or open fly-in and this was proof of that. Good company, good weather, good models and good food, the Elmbridge Club's 50th Anniversary Family Day had it all. ■

Neil Turnbull's KeilKraft Snipe was simply outstanding with its museum quality build and finish.

FLYING FUN AT PONTEFRACT

Shaun Garrity reports from the annual Pontefract single channel & retro meeting

Words & Photos **Shaun Garrity**

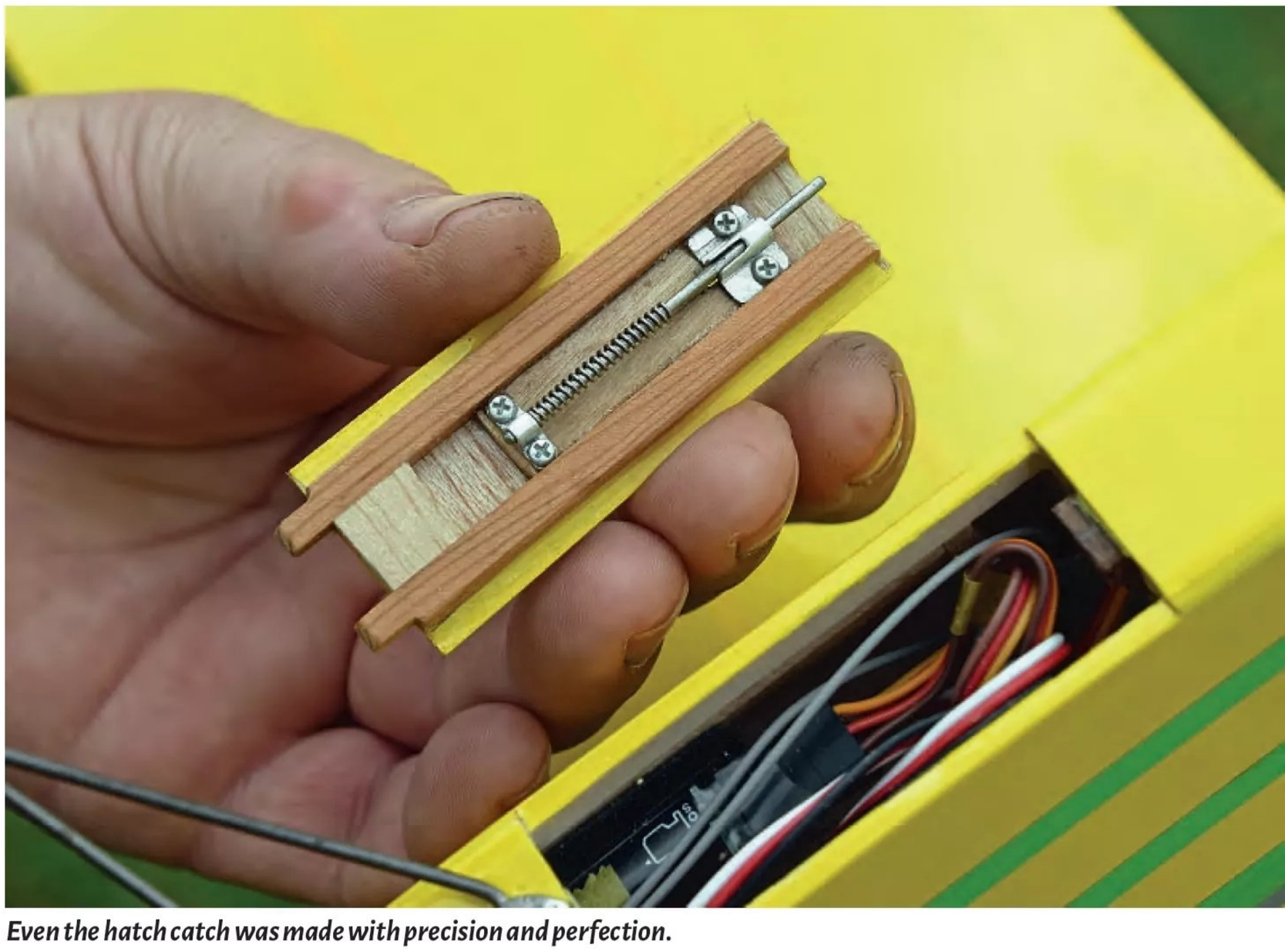
The weather at the Pontefract Single Channel & Retro meet behaved again this year. It was not outstanding but was eminently flyable and not cold, so I'm counting that as a result.

It was the same format as always - electric models of any genre, plus IC / electric control line on the Saturday and the Retro and Single Channel event on Sunday.

GET TOGETHER

With the weather being much kinder there were scores of modellers and models in attendance. The event is now much more than a flying meeting and it has become a great social get together. You can fly, display, reminiscence or meet up with old flying pals. It's all part of the enjoyment, with modellers arriving from as far afield as Devon and Sweden. Sadly, our regular trader, Retro Modeller couldn't make it as both owners had contracted corona virus a few days before, but there were a number of tabletop sellers with event appropriate items to relieve you of your hard-earned cash.

This fly-in is one of the few where you can see modellers keeping the skill of single channel, button pressing flight alive and well. Many visitors are amazed just how precise the



Even the hatch catch was made with precision and perfection.

Just have a look at the 3D printed four stroke on the micro Super 60.

On my bucket build list is the KeilKraft Student, originally intended for reed gear as a multi-trainer. This one is by Mark Deanes.

This Dan Dare-esque model was designed by Roy Clough Jr and appeared in the American magazine Air Trails in 1954. It was known as the 'Anti-Grav' Martian Spaceship.

An absolute stack of engines, including several classics and many at bargain prices.

Kits galore and many sold on the day. Balsa bashing is still the only way for retro modellers.

Pete Christy from Devon always turns up with a fleet of vintage helicopters, this example being a 1975 Morley 2C.

Wes Denton of SAM 35 brought this delta along. It had a surprisingly good performance.

This is a change of pace for Graham Gooch. His usual models are F3A precision aerobats.

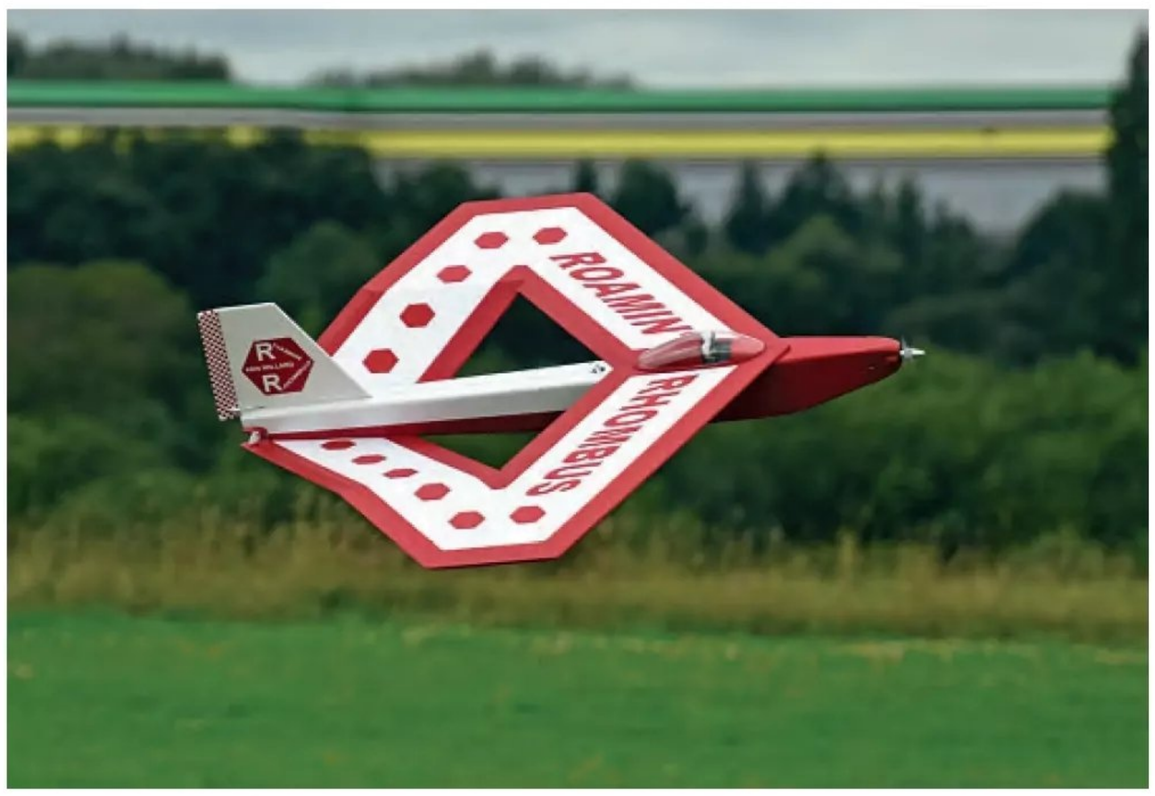
A very rare beast. A single channel 35MHz set made by World Engines.

Ron Buckwell's skill at making one-off transmitters is astounding. He uses a laser to make the labels and cut logos on the cardboard outer case. The nRf transmitter and encoder electronics are also home constructed by Ron using Phil Green's code and circuit design.

A back view of Ron's transmitter showing the attention to detail.

You can get carried away converting old transmitters. Here is my little lot.

One of my favourite old school aerobatic aircraft. Phil Kraft's Kwik Fly Mk3 is still a very capable model.



I've always found Unorthodox models appealing. The Roamin Rhombus flew extremely well. A Ken Willard design from 1982.

One of my favourite old school KeilKraft models is the Super Slicker. This example belongs to Mike and John Watters.

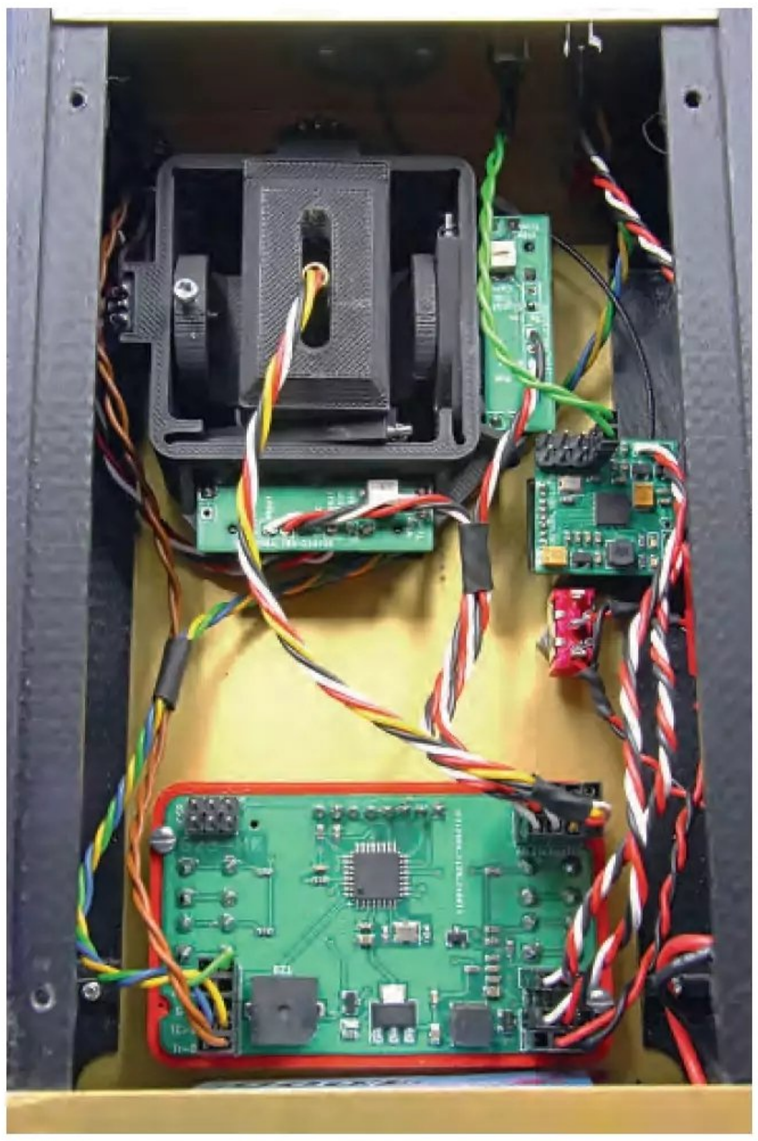
Sheet wing Tadpole designed by Eric Clutton. It flies great and is very simple to build.

I remember seeing the plan for the Oini in Aeromodeller back in 1972. Always fancied building one.

flight and landing can be with just rudder and throttle control.

Another growing part of the retro modelling scene is restoring and converting old transmitters to 2.4 GHz (also 35 MHz), generally using modern encoders designed by Phil Green and Mike Kitchen with commercially available RF modules such as Lemon and FrSky. Many examples seen at Ponte were truly outstanding, matching any commercially produced product. As long as you know which end of a soldering iron to hold and not get burnt, have a basic understanding of electronics, can follow simple, clear instructions and are careful, you should be able to successfully convert a retro single channel or proportional set, the caveat being that the stick units, aux pots, switches etc. must be in a good, serviceable condition. The other option is to ask a mate whose hobby is electronics and who can do the conversion for you. The most important consideration is that the conversion is done well, with accuracy and care. Remember, you'll be using this radio to fly models so there's no place for dodgy soldering or shoddy workmanship.

Tobe's unique four function single stick set as mentioned in the article.



Stick, case, PCBs and electronics were all designed and made by the talented Swede.

FOUR FUNCTION STICK

One very interesting item brought along by Tobe from Sweden was a four-function stick operating rudder, throttle, aileron and elevator. Single stick radios with three functions were popular in the USA from the early 1970s to the late 1990s, so why four functions you may ask?

Well, many years ago Tobe had a serious accident that damaged his left hand. Over time this has started to cause issues when flying with a traditional twin stick transmitter. Discussing this one evening with a modelling friend, who was also starting to experience issues due to arthritis, they came up with the idea. Incredibly, by early morning the next day Tobe had designed and 3D printed a working prototype. Along with the stick unit he has also designed a cuddle box style case with a support strap so he can continue to fly his models.

Tobe has now had many hours flying this configuration and told me he adapted easily. The concept could help many modellers with similar problems to continue flying so he's currently further developing the prototype and working towards offering it commercially as a complete unit for home builders and a DIY conversion for a range of existing transmitters. I'm hoping to get more details soon about this ingenious unit.

Single stick transmitters were popular in America, the Orange RS Systems from 1972 being particularly rare. The Orbit set was also from 1972. The white Ace is newer from the late 1980s and I guess the Logictrol is late 60s or early 70s.

A few of the Bee Baby squadron. Second from the right is Andrew Boddington, son of Dave.

Several years ago, we had the Pulstar as a theme model. Jon Hey made this micro version.

Winner of the Pontefract & District Aeromodellers (PANDAS) Chairman's Retro Modeller cup was Mike Bell. It was presented by Andrew Boddington.

BEE BABY

Every year we have a theme model for a fun comp and this year it was a little-known plane by model meister Dave Boddington called the Bee Baby. It was, after all, intended to be powered by a Cox Babe Bee. This simply constructed, sheet wing biplane was designed originally for single channel, can be quickly built and flies superbly in rudder only guise, but it's simple to add throttle and elevator if that's what you want.

Several years ago, we had ten Veron Impalas (with power pods) in the sky as the theme. Another year was single channel pylon racing - now that was a sight to behold! Anything is possible when you think outside the box.

Fun competitions such as spot landing were run by Wes Denton of SAM 35. If you fancied a go at control line, the guys running the circle were glad to accommodate and give advice on this early form of model control.

As the day progressed the weather further improved, the clouds disappeared and the sun shone, with the last dedicated few leaving at around 6:30 pm.

It was another great year for retrophiles and next year's event is already in the planning stages. So don't hesitate in sorting out your aerial steeds for 2025 and come and join in the fun.

As always send your stories, pictures etc. to **aeroomodeller@gmail.com** and keep enjoying this great hobby. ■

WINGMAN

David Ashby chats to a slope soarer who is rather keen on swept back wings

Words & Photos **David Ashby**

Two things quickly became apparent when I started slope soaring. First, I had a lot to learn and, second, there were some incredibly clever flyers, designers and builders on the hill who rarely, if ever, flew anywhere else. One, Paul Westrup, usually brought along a large sweptback wing of his own design and making, then flew them with particular skill. I asked what he called his creations.

"Oh, I've never really thought of a name," came the reply. Before he added, *"...I should do really because I've built 31 of 'em."*

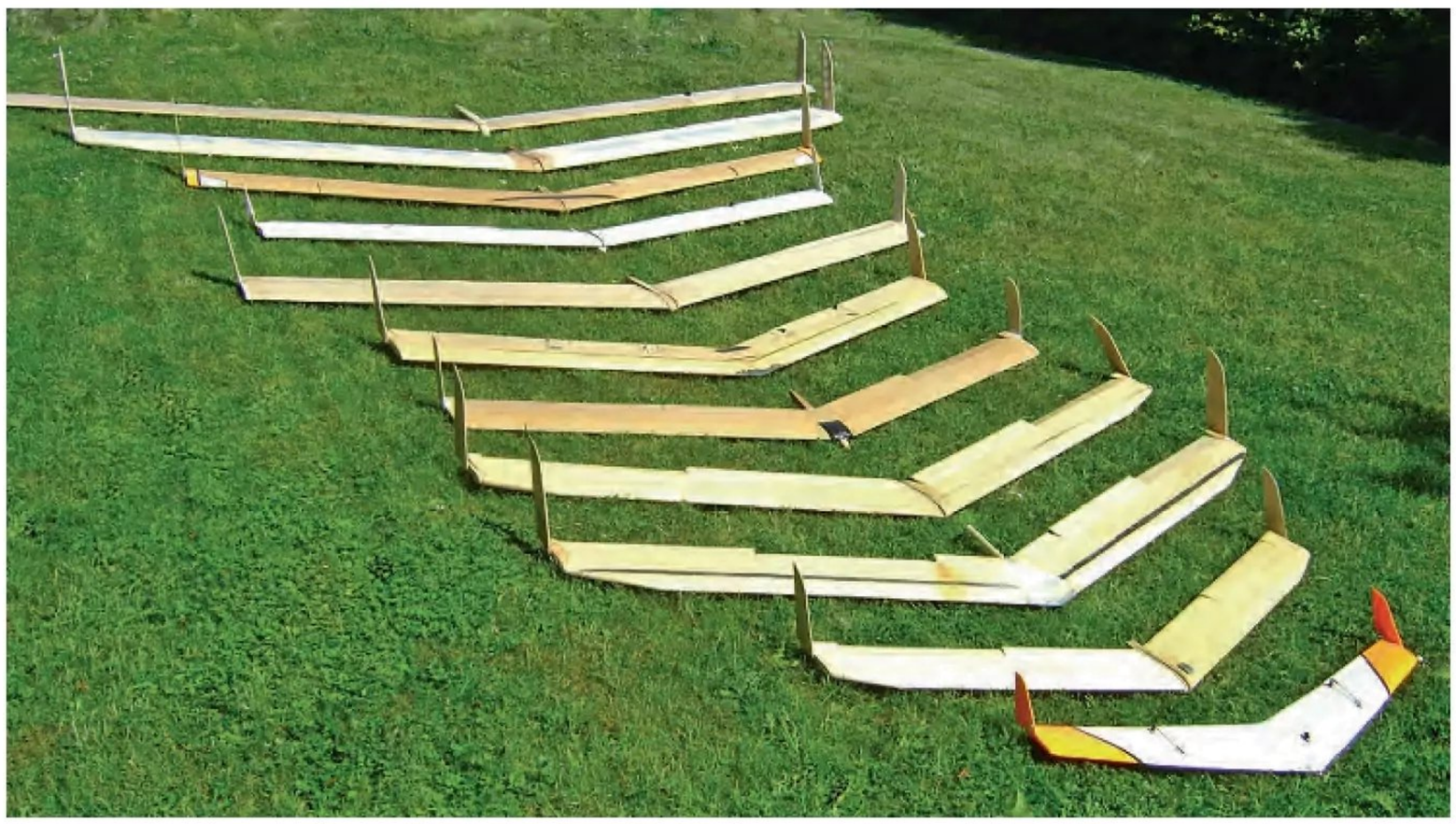
Hang on, thirty-one! To say this was a man who liked large sweptback wings was flirting recklessly with understatement. I needed to know more. We've slope soared together for a few years now but only recently sat down for a chat.

Q: How long have you been flying?

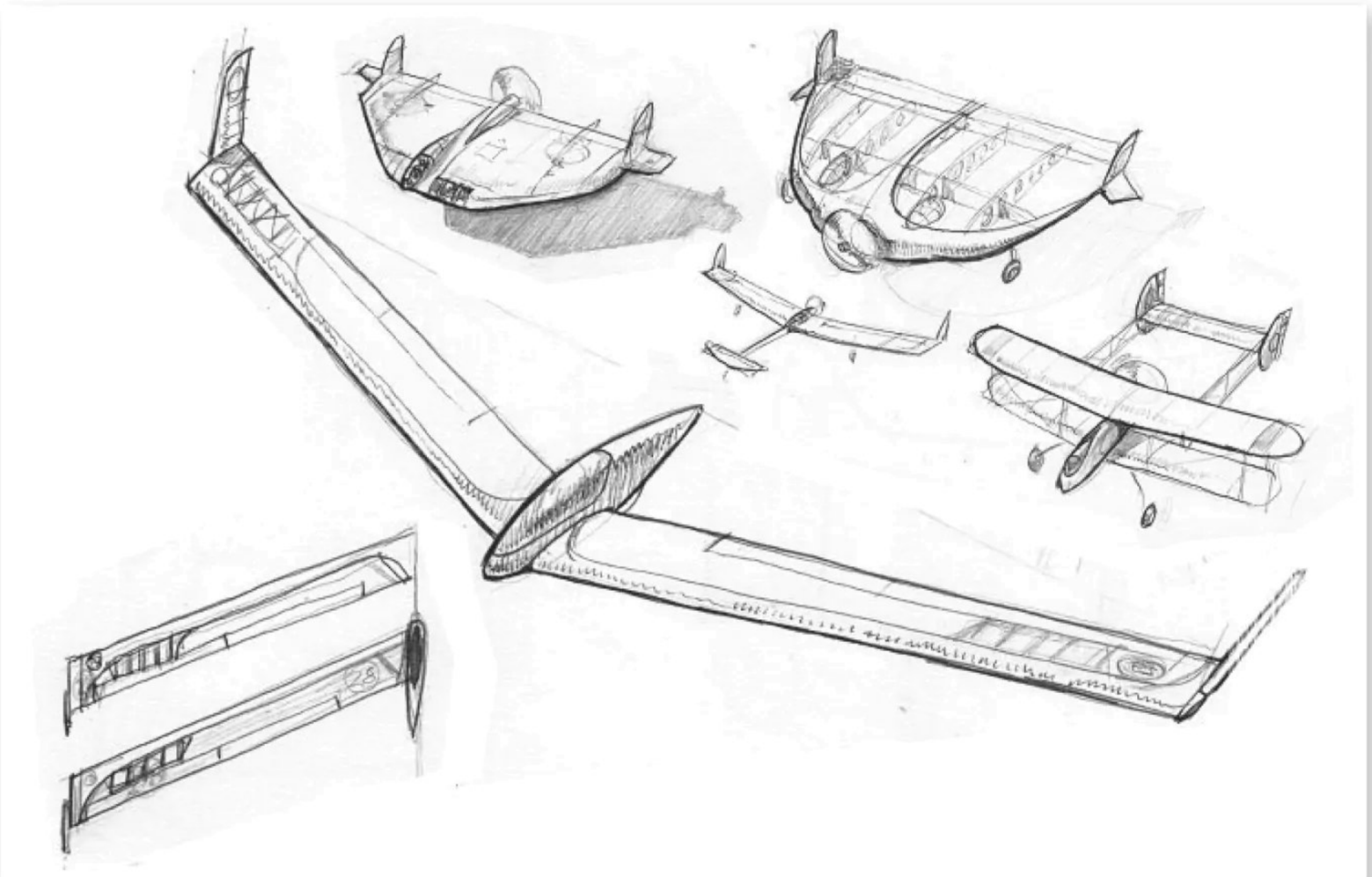
A: I bought my first model, a Precedent Hi-Fly with two channel 27 MHz Futaba M Series radio, in 1987. Unfortunately, being a teenager with no transport of my own I couldn't get up to the slope often enough to reach a decent level of competence. This prompted me to build a Teenie Trainer from a free plan in Radio Modeller powered by a PAW diesel so I could teach myself in the local farmer's fields. The

It's a big wind model really but gets away in lighter conditions with a bit of care.

It first flew last year.

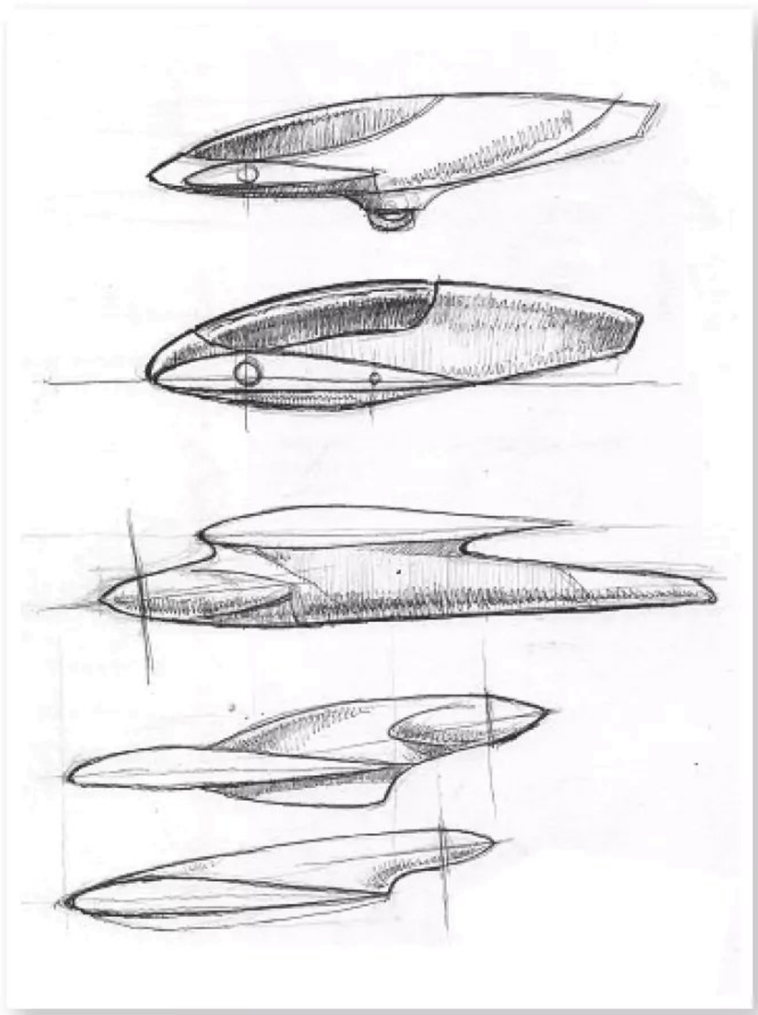


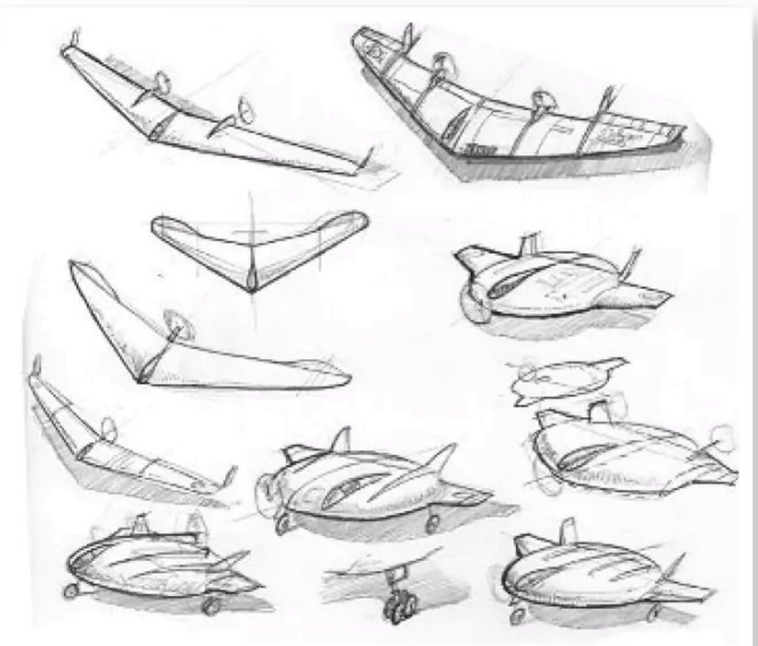
Did I say he likes to design and build flying wings?



Paul's design sketches are fit for framing.

Foam core and glass skinned construction is a common feature.





PAW was an absolute pig to start but many diesel-soaked shirt sleeves, smashed balsa and skinned knuckles later, I started to get the hang of things! By this point I'd also got myself a moped so I would head up the slope, with my Mini Phase poking out the top of my rucksack, whenever wind and free time allowed, plus I could now tap into the knowledge and experience of my fellow flyers. So, long story short, I've probably been flying competently for about 35 years. However, the tenacious streak laid down in those solo, demolition derby years stood me in good stead for messing around with own design oddities later on.

Q: Have you always flown on the slope?
A: Pretty much. I retired the diesel engine once I had gliders for most wind conditions. I have dabbled with some electric powered stuff (more recently indoor based) and I'm also trying get up to speed with a bit of quad flying. But to my mind, none of that can beat the

magic of a summer's day on a grassy hillside with buoyant air and the company of a few like-minded individuals.

Q: What is it about swept back wings?

During my solo years I would trawl the local libraries for all the information I could possibly glean. I recall coming across a photo of one of the WW2 Horten wings and was instantly fascinated. A few years later Dave Jones started producing Silent Flight magazine and was keen to push flying wings in the competition scene, so both his magazine and his thermal soaring column in RCM&E featured nuggets of information on the subject. I'd always been drawn to the more alternative designs out there and the swept wing format really did it for me aesthetically. This, coupled with the enjoyment I get from designing and tinkering, meant it was an aeromodelling avenue that I could not help but pursue.

Q: Thirty-one is quite a lot, isn't it?

In the early years I was blundering around in the dark with varying degrees of success. Mostly the kind of success that involves a sudden leap

His latest, this 1.5 metre span version, is designed for park and indoor flying, although it's a bit large for smaller indoor areas.

No. 27 weighs 2430 g and uses a 23-degree sweep.

Number 27 gets away on the hill last year. This 3150 mm span version is his favourite.

Remember this? It's the Chief Flying Instructor from Cambria Models. We need more models like this. Today's newcomers don't know what they're missing.

Recently updated, an outrunner and six LiPo cells now provide the urge.

Tony Leigh built this one back in the early 80s and still flies it.

forward in knowledge brought about by a 'rapid, unscheduled disassembly'! But through an iterative process I've honed my designs to suit the way I like to fly.

Q: What construction methods do you use?

Anything from conventional built-up, veneered foam cores to glass skinned, vacuum bagged construction. For rapid prototyping, vacuum bagged foam wins hands down. Once I had the process sussed, I could produce a flyable prototype in about 20 hours.

Nowadays, with the progressive demise of local model shops, I'm focusing on building around readily available materials like white foam, aluminium tubing and ply from Wickes, resin from eBay and Koto/Ayous wood veneer from **www.thewoodveneerhub.co.uk**. So these days I mostly use conventional foam-veneer construction with a full depth wood spar and fibre glassed D-box, complimented with localised patches of carbon in the high stress areas.

Q: Describe the flying characteristics?

They're great thermal machines. You can turn them on a wing tip to work tiny areas of lift. They'll also climb in lift quicker than a conventional model - but they'll also come down in sink quicker too!

Q: What's your design methodology?

The fact that the wing is providing both lift and trim does bring about a level of compromise. For example, with a conventional layout it's relatively simple to alter the decalage. With a swept flying wing decalage is achieved using washout so it's locked in as part of the construction. It's therefore important to design the wing for a specific purpose to avoid excessive trim drag but there are a few spreadsheets out there that calculate the washout for you.

Most importantly, the higher aspect ratio designs need to be built as stiff as possible. Every swept wing will have a speed at which the bending of the wing creates a self-amplifying flutter that results in almost instant destruction. Ultimately, nothing can tell you how the model will handle other than actually building and flying it. As such, the iterative prototyping route just can't be beaten!

Q: What's your favourite all-time slope model?

That's such a difficult question to answer. I think it really does depend on the conditions and the hill. A couple of my most recent wings will definitely be getting flown to death in the coming years. However, in terms of absolute versatility it would be my old Race-M, although I have far less of an urge to zoom around these days! But I've had some of my most memorable flights with models like the Radian or Alula where a combination of location (I love soaring unusual spots) and wind speed would have made it impossible to fly pretty much anything else.

Q: Size wise, what are your smallest and largest wings?

One of my first successful wings was my smallest at 39" span. I flew that thing so much that the nose ended up being a loose conglomeration of white foam beads and balsa splinters held to an approximate shape by the Solarfilm covering! The largest is my current 15-foot span wing model that weighs in at 13.5 lbs, has a 23-degree sweep and a HS522 wing section thickened to 12%. It's built for larger slopes like the South Downs.

Q: How do you lay down a design?

For aspects like calculating the C of G location, washout angles and refining the design to best fit available material sizes, I use CAD. However, I still prefer to hand draw most things, but I

"Most importantly, the higher aspect ratio designs need to be built as stiff as possible"

never really produce a full plan for my designs. There's usually a few key lines and dimensions on a bit of paper and the model just tends to grow from there.

Q: What's next?

This year I've been going to my local indoor flying venue to test an indoor/park fly foam wing. I'd like to experiment with a six control surface wing allowing for elevator placement at the middle portion of the wing. This means the elevator down throw will pitch the nose up, leading to a more efficient camber change relationship than with conventionally placed elevons. I also have an itch to build something that Mother Nature has produced - a pterodactyl or a vulture, maybe?

When he's not building or flying Paul earns a living as a designer, maker and illustrator, as just a glance at his impressive work at **www.paulwestrup.com** will confirm.

CFI

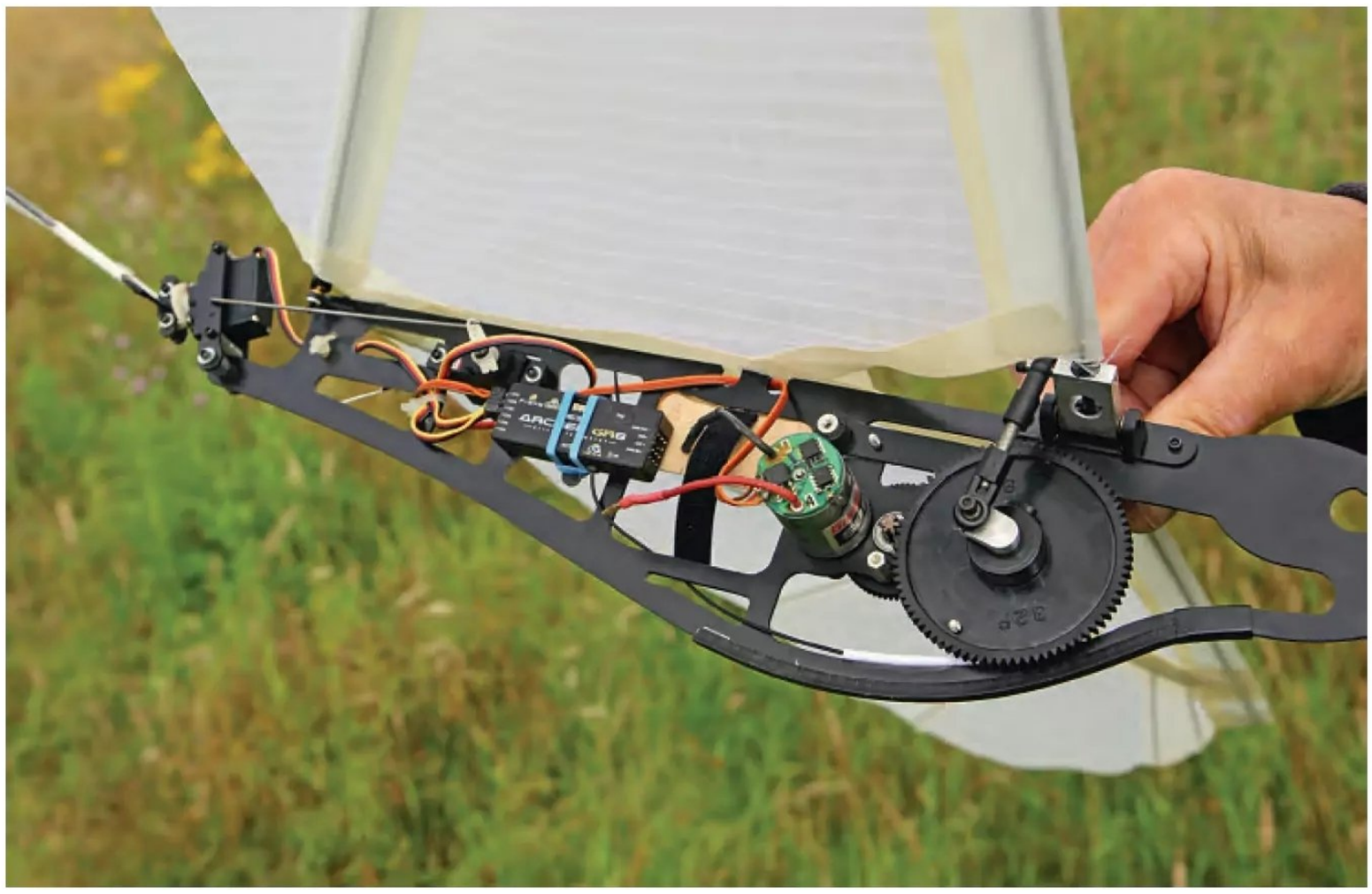
Recognise the blue low winger on these pages? Well done if you said Chief Flying Instructor, the long since discontinued 58" span Cambria kit that's now a rarity. My clubmate, Tony Leigh, built this one as a teenager back in the early 1980s. It's one of those models that virtually nobody produces in ARTF or kit form anymore, yet is a model type that a lot of flyers foolishly neglect having gained their wings with a high-wing trainer.

Like a lot of models from the period, some think it's a tad heavy when they pick it up for the first time, especially those who've progressed on a diet of contemporary laser-cut balsa and foam airframes. It was designed for .20 to .35 size IC engines and hard treatment, but that 'all-up' means it cruises around comfortably on breezier days.

This one has had three different schemes over the years but still flies well and doesn't hang about in its dotage thanks to an AXI 4120/22 Wave outrunner (420kV), an 11" x 12" prop and six LiPo cells. Rated for models weighing up to 3500 g, or 5000 g gliders, that motor is a bit over-specified for this 2494 g (5.5 lb) model but better over than under-specified, I guess. Incidentally, AXI Wave motors have some degree of waterproofing, presumably for marine applications.

BIG FLAP

You may have seen my report from the Elmbridge Club's 50th Anniversary Family Day but there was one model I didn't include that caused a bit of a flap (sorry!) Like me, you probably see rubber powered free flight ornithopters every now and then, but an R/C example is very unusual. In fact, I don't ever recall seeing one before.



It's about 20 years old and came from the USA. Note the brushed motor.

Charles Smitheman and his R/C Ornithopter.

Launching is the easy bit!

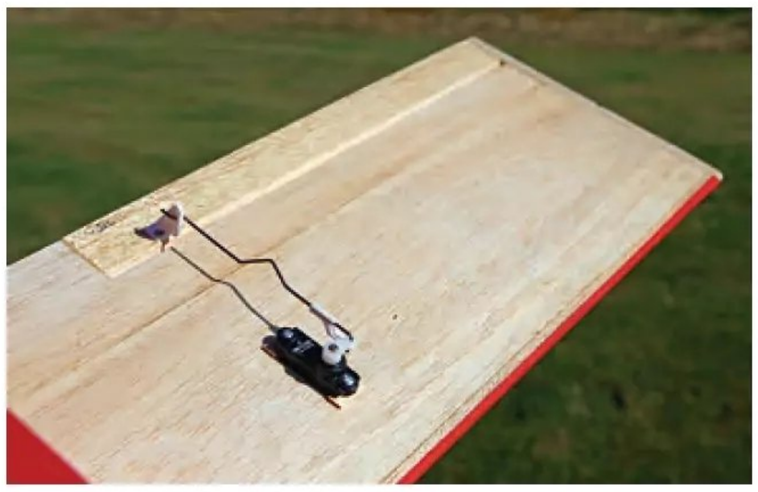
There, it's just an aileron Sleeker. No harm done.

The flight characteristics were initially 'interesting'. Note the crazy amount of tail deflection required to guide it.

Charles Smitheman brought this one to the event. It's a Sean Kinkade 41" span ParkHawk given to him by his friend David Allen, made in the USA but no longer produced. A quick Google reveals that there were several ornithopters in the series from this maker, with spans ranging from the 96" SkyBird down to the 26" YardHawk. Charles thinks this one is around 20 years old. You can appreciate the mechanics from the photos. It uses a brushed motor and a 2S 800mAh LiPo battery that provides good endurance. Steering comes from the all-moving tail.

Charles said the flight characteristics were initially 'interesting'. It went up and down but didn't go forward in any noticeable way. Moving the C of G forward a little and adjusting the incidence solved that, although it prefers calm weather and the steering is a bit vague, especially when the breeze picks up.

It doesn't get flown very often as the mechanism is starting to show signs of wear but it's quite a spectacle and surprisingly bird-like in the way it moves around, even more so when



Single channel purists should avert their gaze...

flapping is mixed with momentary soaring. A quick web search will find videos of other machines from this maker.

SLEEKER SACRILEDGE

Single channel purists should turn the page. I built Dad's old 1968 vintage single channel Sleeker design a few years ago, at the same time adding elevator and throttle, moving the horizontal stab' to sit on top of the fuselage and dispensing with the undercarriage. The plan was re-published here in RCM&E in 2015.

I still fly the model every now and then but recently thought it was time to add an aileron wing. I'm not the first; put 'Sleeker' in the search box at modelflying.co.uk and you'll find not only ailerons but enlarged versions too.

Adding ailerons is easy and barely warrants a description. This would never be a precision aerobat, so I left a smidgeon of dihedral, just to prevent the appearance of anhedral in the air. A mini servo was mounted externally on each side, ailerons cut, taped into position

> "...the flight characteristics were initially 'interesting'. It went up and down but didn't go forward in any noticeable way"

and connected. The wing was given a coat of sanding sealer, then a couple of passes with rattle-can lacquer. Job done.

Ailerons add a bit more aerobatic interest to the flying performance, but the glide remains pretty poor, a trait others have noted. Perhaps Sleeker reflected compromises of the era when, if you were going to fly around with just rudder for company, then a tough little 'Tonka Toy' of a model was your best bet. Dad did make a larger version, although that shared the fully sheeted wing of the original so perhaps it's time for 'Sleeker Lite' with a part-sheeted wing and a built-up tail. I'm starting to line up a few projects for the winter building season so this might just be one of 'em.

That's it for now but, till next time I'm at **justforfunrcme@gmail.com** if you wish to admonish me for the blatant retro design abuse. ■

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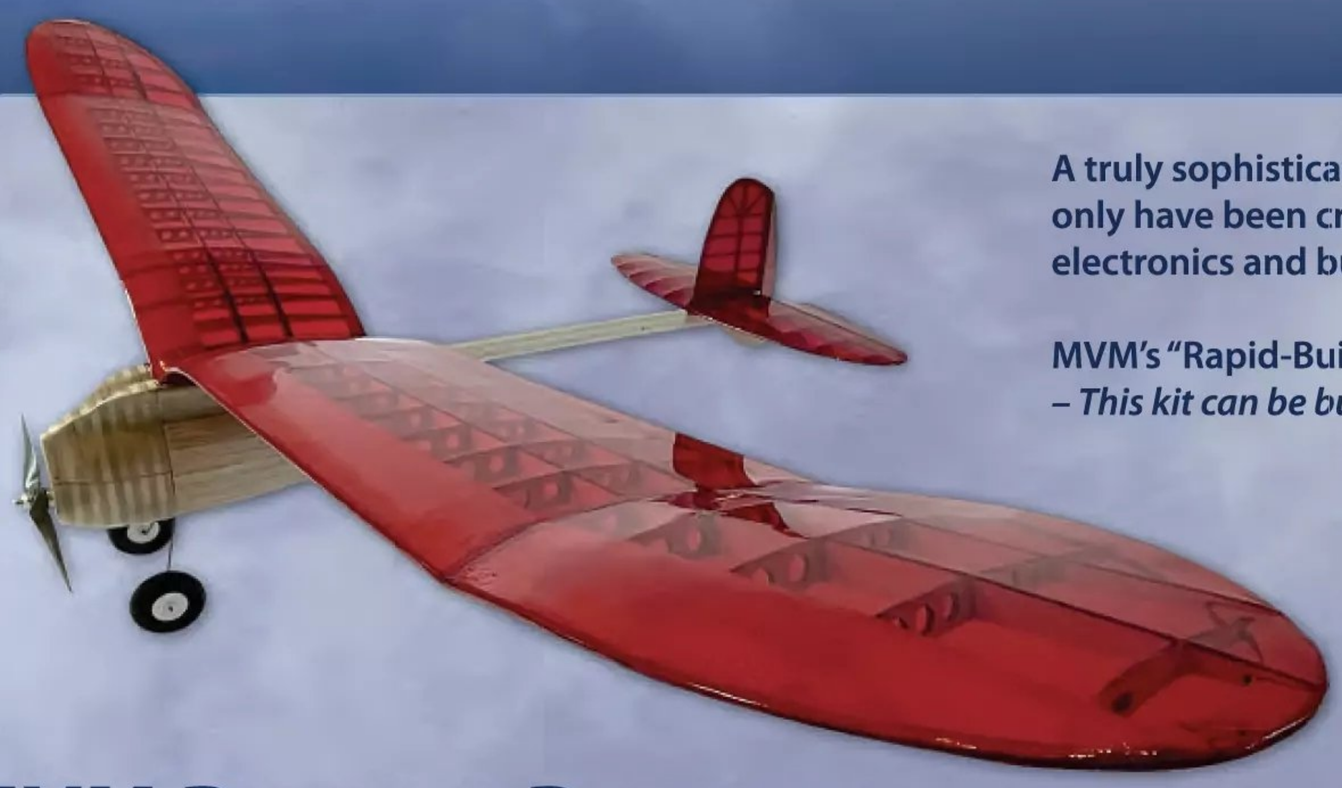

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BUILDING WITH CORREX

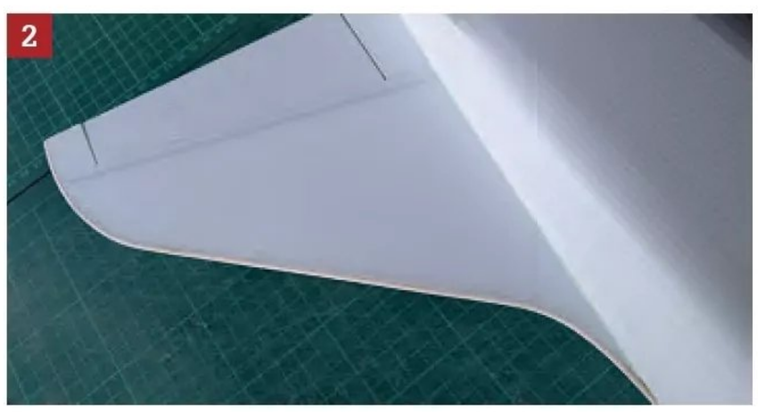
In his final article on building using fluted polypropylene sheet Phil Stone shows how he adds the finishing touches to his PSS Hawk jets

Words & Photos **Phil Stone**

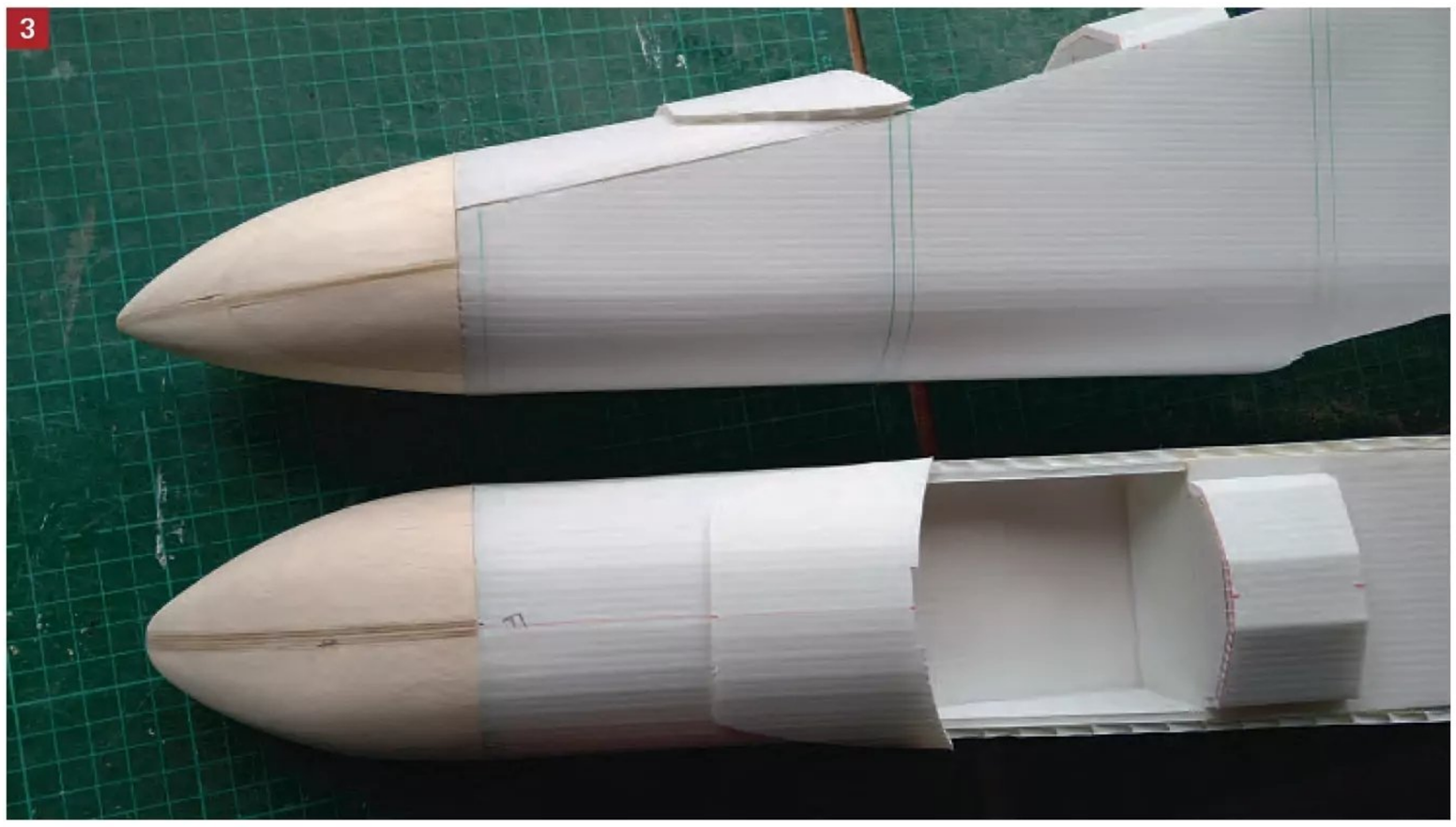
You are now in a position to close the front and rear sections of the fuselage. Check the rear fuselage skins for fit against one another and the tail fin and trim as necessary. I usually add small supporting pieces of Correx where needs be. Glue one side of the fuselage skin in place with Evo Stik and hold it closed until dry using tape. Add a further piece of Correx to the underside of this skin along top dead centre to support the other fuselage skin and then glue that side too. (**Image 1 & 2**)

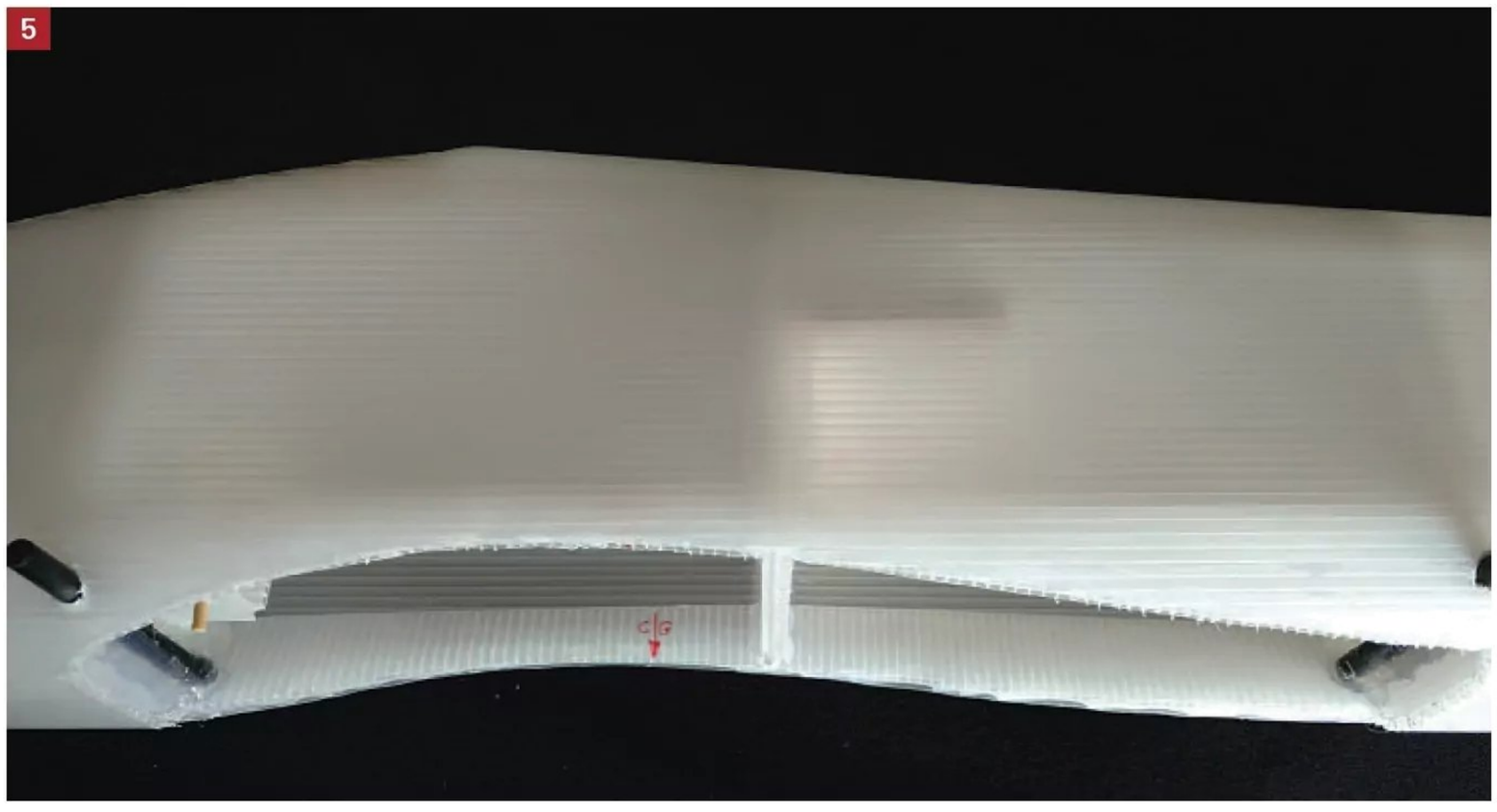
1

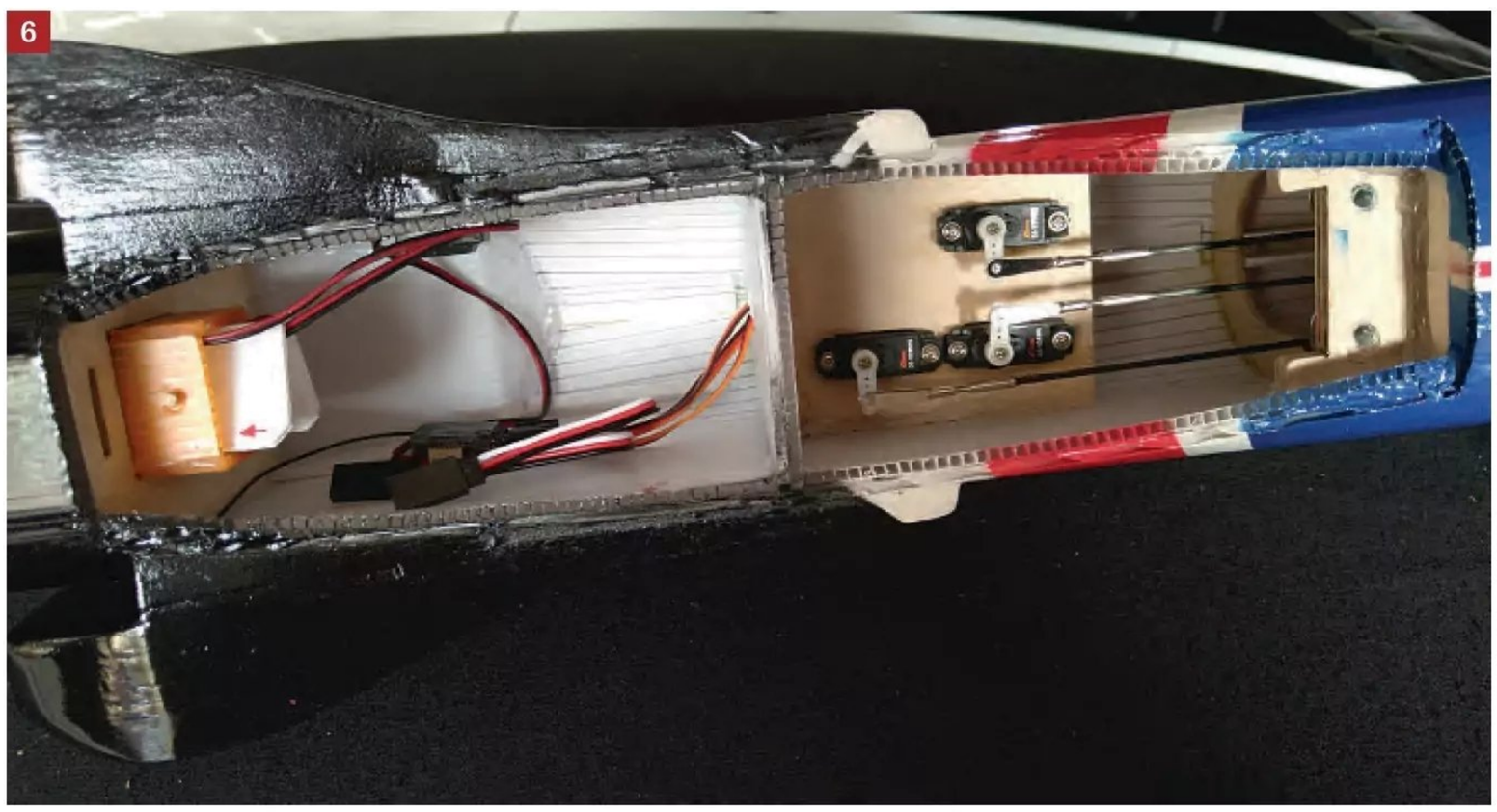
2



Phil displays the upper and lower surfaces of his Union Jack Hawks.







Mark and cut out the cockpit floor and fuselage front upper piece from 3 mm Correx. Size the cockpit floor to fit the fuselage opening, then score and fold up the rear section as per the plan. Add supporting strips of Correx wherever necessary and glue in place using Evo Stik. De-flute the front upper piece and then size to fit neatly with the fuselage. Once again, add supporting strips and bond in place with Evo Stik. Trim any excess fuselage skins flush with F1 in preparation for fitting the nose.

The nose and air intakes, which we'll come to later, need to be made from balsa or foam. Having recently acquired a 3D printer then this is also now becoming another option for me and one I have already explored quite extensively on my latest MB-326 Impala build. For the Hawk I made the nose from ply and balsa and once sanded to shape I bonded it in place with Evo Stik. (**Image 3**)

You may have noticed that I also created a deeper cockpit opening and added some instrument binnacles for a little more realism. If you're looking to include a pilot figure, then something in the region of 1:10 to 1:12 scale will fit nicely.

The top view of the nose on the plan looks too rounded to my eye so I made mine a little more pointed. (**Image 4**)

WING FIXING & BATTERY RETENTION

If retaining the wing with dowels and rubber bands then insert some 6 mm wooden dowels through the fuselage, adjacent to F3 and F5, and then hot-melt glue in place. (**Image 5**)

If using my wing bolt method, embed the nuts into a piece of 9 mm ply or similar, spaced to suit your rear wing fixings, then bond in place with PVA and hot-melt glue as appropriate. Cut a slot through F3 to accommodate your wing's front location tang. To do this I would first recommend fitting a spacer of around 2 mm thickness underneath the wing's front location tang. Then, with the wing flat on your work surface, measure the height up from the work surface to the underside of the tang. Measure this same distance up from the underside of your fuselage and mark a line across F3 accordingly – this will be the lower edge of your slot.

With the slot cut check the fit of your wing. By incorporating the spacer, you now have the opportunity to adjust the tang height as necessary by either adding a thinner or thicker spacer.

This photo of the underside of one of my completed Hawks also shows the method for retaining the receiver battery pack. A V-shaped piece of Correx is inserted up against the battery within the tube and then held in place by pushing a wooden skewer right through the tube and V-piece. It also shows there is plenty of space remaining in the forward compartment for installation of the receiver and switch harness, thus keeping all the wiring safely away from the linkages in the rear. (**Image 6**)

"If retaining the wing with dowels and rubber bands then insert some 6 mm wooden dowels through the fuselage"

CANOPY

The Hawk canopy is long so will most likely need to be produced from two 2 litre pop bottles moulded over a wooden former. The cheapest pop bottles are usually the best as they tend to have the least number of ridges moulded within them. Carve and sand a wooden former to shape, then, having cut the top and bottom off your pop bottle, slide it over the former and wedge it in place as tightly as possible, pulling the bottle as near to the former profile as possible in the process. Using a hot air gun heat the bottle to shrink it over the former. If, like me, you need to make the canopy in two pieces then aim to make the join in line with the canopy frame (as marked on my former) and glue the two pieces together using canopy glue. (**Image 7**)

The canopy frame can either be painted or replicated in tape as I did here on my pair of 2010 Hawks, the cream-coloured tape masking the canopy joint. Note that you will never fully remove any mould lines already present within the pop bottle. (**Image 8**)

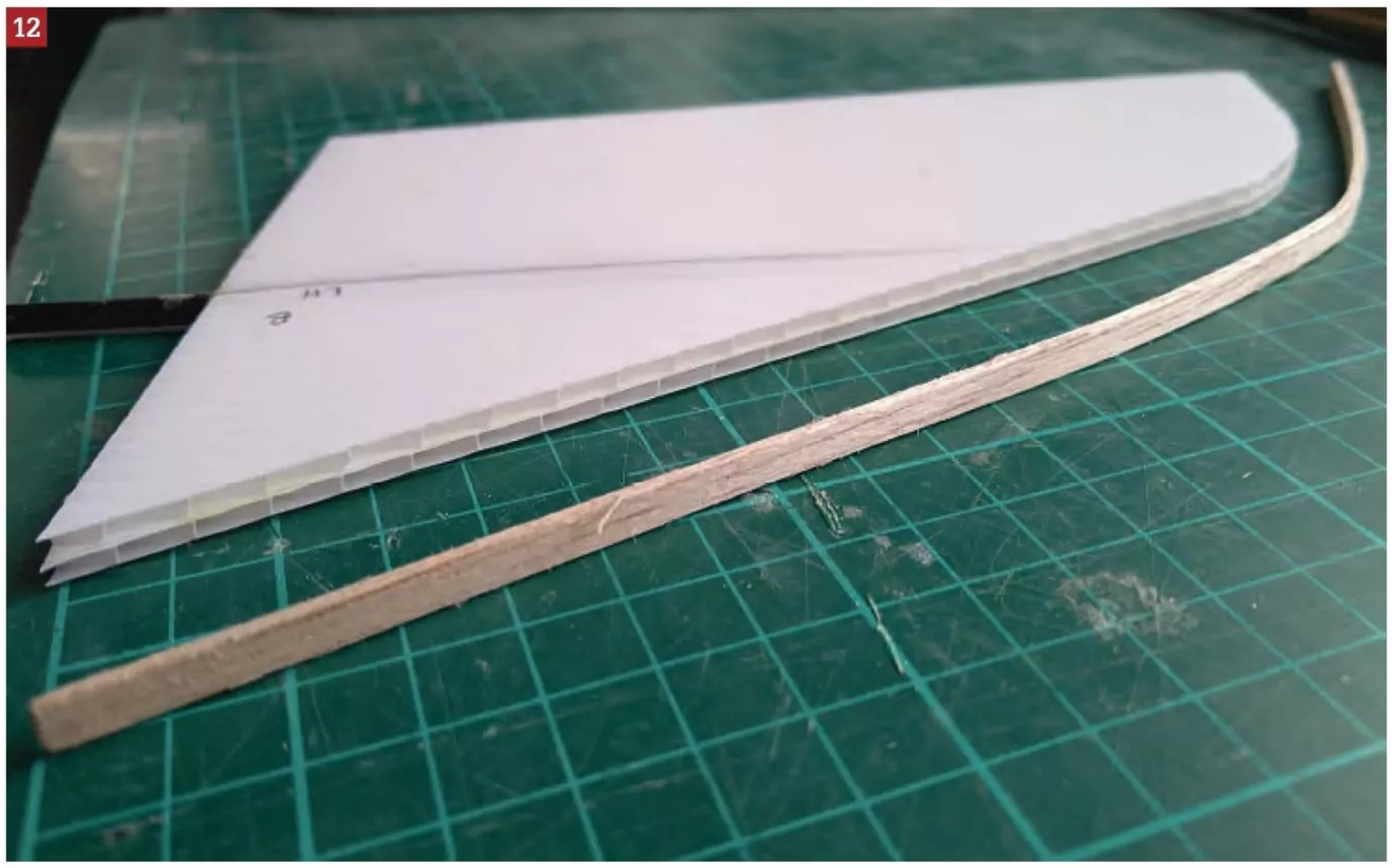
The canopy can be retained by pins and/or small self-tapping screws. Pins can be pushed through and, where accessible on the inside, held in place with a blob of hot-melt glue or similar.

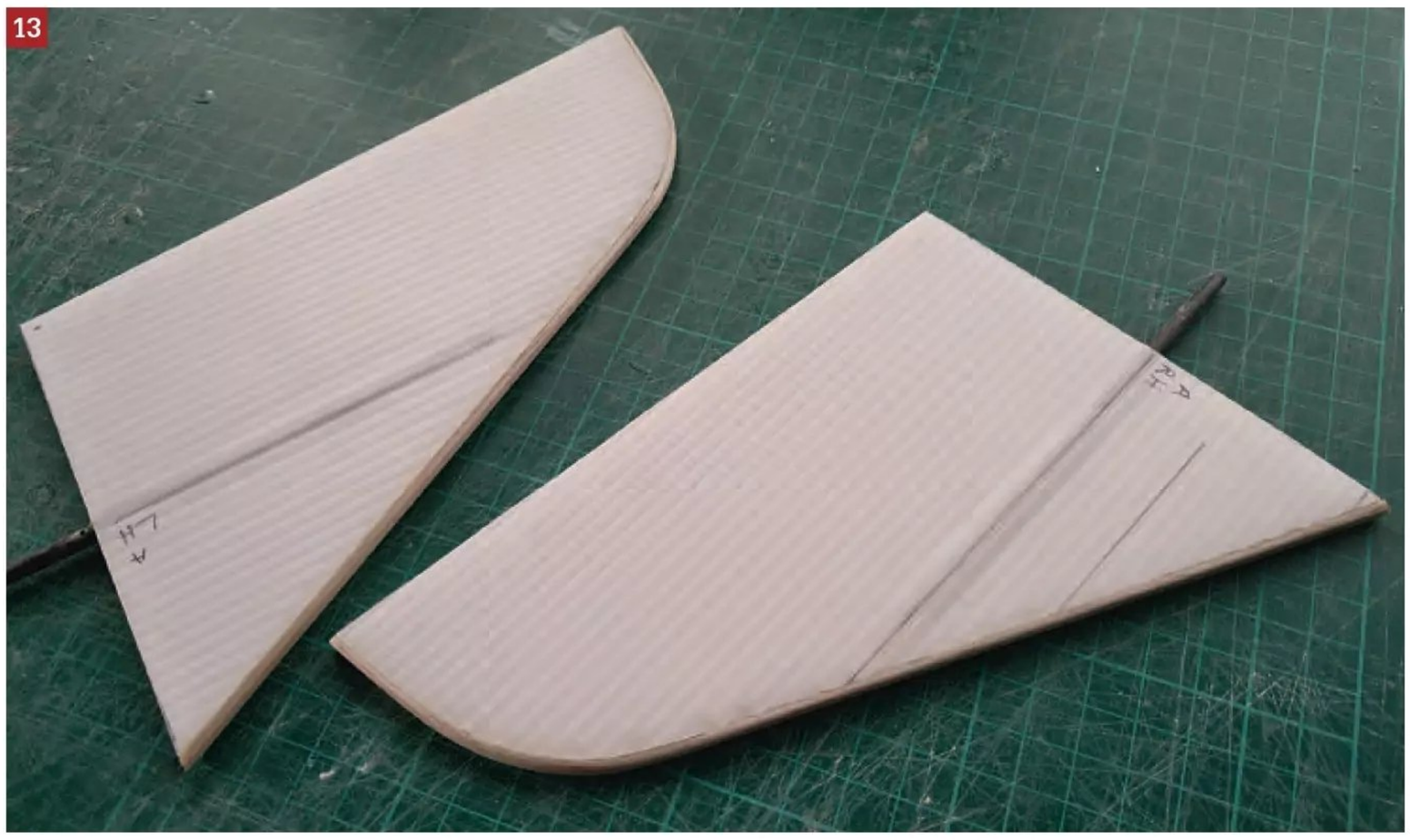
SIDE AIR INTAKES

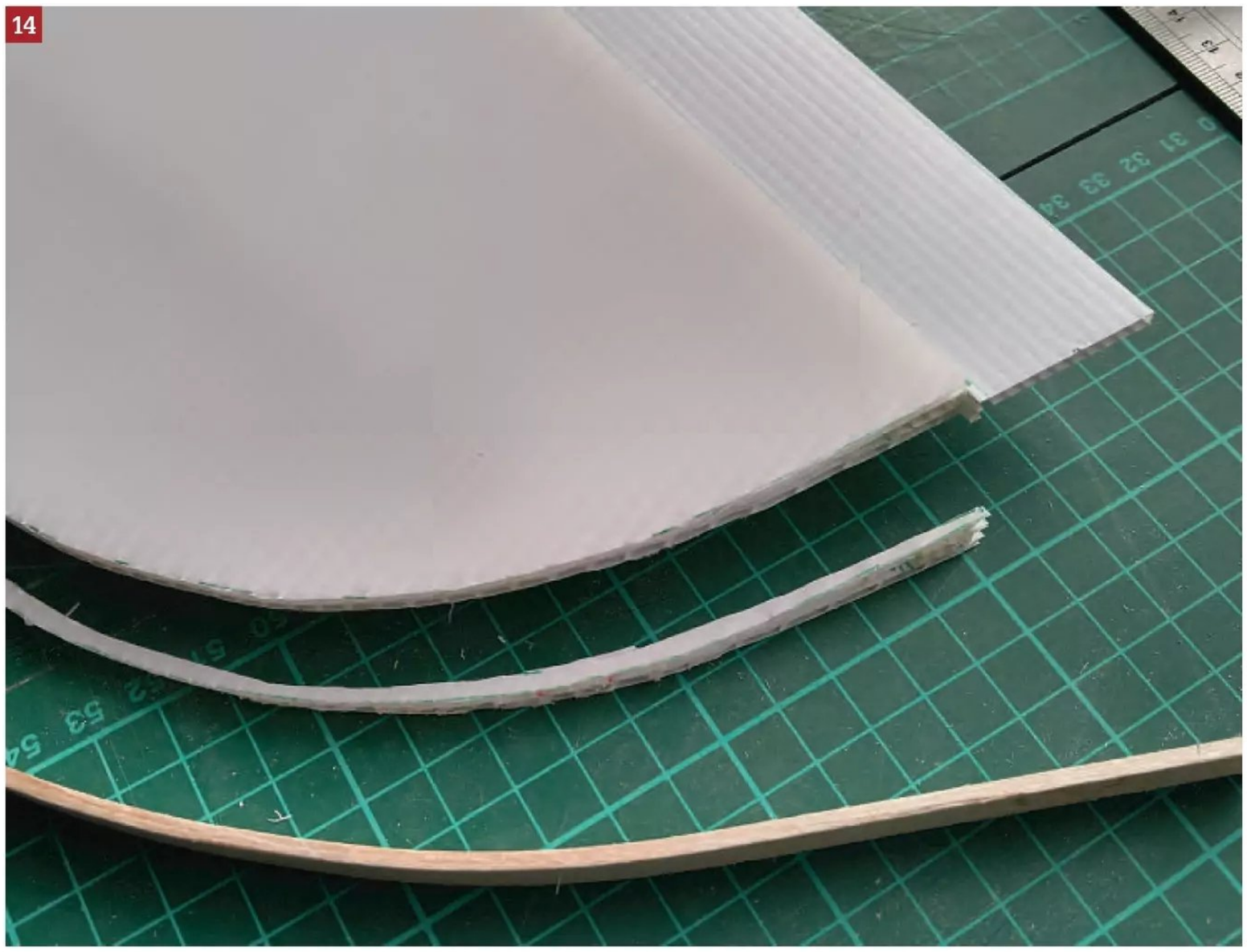
The basic profile of the side air intakes is shown on the plan. Using this and reference photos carve some pieces of foam or balsa to shape. If you intend spraying your finished model, then I would advise priming these before bonding them in place with Evo Stik. (**Image 9 &10**)

Finally, glue the F8 exhaust cover in place.

Congratulations once more! You now have a completed Hawk, ready for final covering and







trimming and fitment of the remaining radio gear. (**Image 11**)

Before moving on to the final covering and trim I thought I would share another of my mods with you. On the 2010 Hawks I started experimenting with closing off any exposed Correx flutes, partly for aerodynamic improvement but mostly for looks, it has to be said. So, you may have noticed already that areas like the leading edges of the tail feathers and the wing tips have had strip balsa glued around them. I first soaked the balsa in hot water and taped it around each curve until dry, then bonded each piece in place using Evo Stik and sanded them to shape. More recently I have also found clear Gorilla glue suitable for doing this. (**Image 12 & 13**)

Each wing tip necessitated the removal of a corresponding piece of Correx in order to let the balsa edging strip in. (**Image 14 & 15**)

On subsequent builds I have extended this even further by gluing thin ply on to the end faces of control surfaces, particularly so on my 1/8th scale Super Corsair and MB-326 Impala.

If you don't want to go to these extremes, then after painting my earlier Red Arrow Hawk I simply used Blenderm tape to cover the straight portions of the tail's leading-edge surfaces. And if you're covering in vinyl then just use another piece of that.

FINAL COVERING & TRIM

As already mentioned, I use a small amount of filler in places to mask any unsightly deformation and gaps within joints. It's not really necessary if you intend covering in vinyl but well worthwhile in my opinion if painting. Do restrict your use of it though to regions where it can gain good purchase within gaps and the like. Don't try to blend a thin layer out over the surface of the Correx because I have yet to find a filler that will properly adhere to it.

You can choose to either cover your completed Hawk with self-adhesive vinyl, paint or a combination of the two. Like Correx itself, self-adhesive vinyl will not form around compound curves so areas like the nose and air intakes will require a number of overlapping joints. For this reason, I have nearly always spray painted my completed models. Whichever method you adopt ensure that you thoroughly degrease your model first using panel wipe or similar. If spray painting then also apply a good quality plastic primer first or else you will find your paint flaking off all too readily. Although not cheap any more I have found the Plastikote plastic primer to be one of the best and indeed their spray colours too. The Plastikote plastic primer is clear so if using that you may need to follow up with a traditional white or grey primer afterwards before applying your chosen colours.

16

The Red Arrows Hawk is a relatively simple scheme to do, being fully spray painted in red and with all the graphics cut from vinyl. Having access to a vinyl cutter is also a bonus. (**Image 16**)

The Union Jack covered 2010 Hawks were one of my most time-consuming schemes to recreate. The four main colours were all spray-painted, necessitating a considerable amount of masking. The graphics were a combination of self-adhesive vinyl and paper prints covered with an exterior grade clear tape. (**Image 17**)

17

RADIO INSTALLATION & CG

With your Hawk now looking its best, install your receiver and switch harness and then determine the best position for your battery pack. Unlike most prop-driven aircraft, with their heavy engines up front, most jets have their engines located close to the aircraft's CG so there should be no need for you to add any additional nose weight. You should be able to balance your Hawk by simply sliding your battery pack along the tube to achieve the plan figure of 120 mm from the root leading edge. Cut suitably sized Vee shaped sections of Correx to fit either side of the battery pack and secure with a wooden skewer, as shown previously.

AUW for a Hawk with four servos operating just the ailerons and horizontal stabiliser will be in the region of 1200 g. Adding another servo and rudder will likely increase this to something over 1300 g.

The Union Jack Hawks were one of the most time-consuming schemes to recreate. The four main colours were spray-painted, with graphics made from self-adhesive vinyl and paper prints covered with clear tape.

The long Hawk canopy can be made from two 2 litre soft drink bottles moulded over a wooden former.

"Unlike most prop-driven aircraft, with their heavy engines up front, most jets have their engines located close to the aircraft's CG"

FLYING

From my experience most of the Correx models built from these plans tend to fly at their best in wind speeds in the region of 13 - 20 MPH, although with ballast I have occasionally flown them in 40+ MPH conditions. The Hawk is very benign with no real vices and will easily perform rolls and loops, and even fly inverted with some compensating elevator.

Correx models, by their very nature, are never going to be the most aerodynamic of models but a major plus factor resulting from that, for any novice flyer, is they tend to fly more slowly.

I have had countless hours of fun flying my Hawks and, like me, you'll no doubt find that having built one, and still having reserves of Correx, you'll be wanting to try building another!

If you're looking for more inspiration or info then get onto the RCM&E forum at forums.modelflying.co.uk, scroll down to the Power Scale Soaring Association section, look in 'PSS build blogs' and click on 'Correx built PSS models'. As well as photos and videos of some splendid Correx models you'll also find more details on both my Super Corsair and Impala.

Have fun! ■

Correx Hawks are benign to fly and will easily perform rolls and loops, as well as flying inverted with some compensating elevator.

DATAFILE

Name:	Hawk T1
Model type:	Correx PSS glider
Designed by:	Trevor Stroud
Wingspan:	1250 mm (49.2")
Weight:	1200 g (42.33 oz)
Functions (servos):	Ailerons (2), All-Moving-Tail (1)
Control Throws	
Ailerons:	15 mm up, 8 mm down
Elevator:	12 mm up, 12 mm down
(All measurements taken from the trailing edges)	

My silver medal winning Chipmunk.

FAI SCALE WORLD CHAMPIONSHIPS–PART 1

Danny Fenton files the first of his reports from mid-August's gathering of top scale modellers held in Romania

Words & Photos: **Danny Fenton**

The latest FAI Scale World Championships took place in Ploiesti, Romania from August 11 - 17, 2024.

WHERE TO START

As a scale modeller my dream has always been to fly at the World Championships as part of a British team.

The FAI re-introduced control line scale to the World Championship for 2024 and the competition in Romania was to be a test event. If well supported F4B would be back on the international calendar. Having qualified for the British Team in F4B I was thrilled to be asked to be part of the GB scale team heading for Romania. I didn't need long to think about my answer!

Preparations for the 11-day trip started in earnest with a series of online meetings where we thrashed out ideas on how we could get

It was a journey with more highs and lows than a fairground 'Waltzer' - but what a journey!

the team, our models and all our equipment to Romania in a cost-effective manner. Following Brexit we would need a carnat (an international customs and temporary export-import document) to take our equipment into Europe. We managed to put together an import/export document that would satisfy customs - or so we thought...

We explored taking the models on the flight with us as sporting equipment but that really wasn't viable. In the end we found a local shipping company that helped with the paperwork and the cost for two road trunks to Romania and back was affordable. Plane tickets were purchased and a smashing hotel, a 20-minute drive to the North of Ploiesti, was booked. Car hire was arranged and that only left LiPo transport.

The GB F4H team consisted of Mat Dawson flying his Blackburn Firecrest, Nigel Nixon flying a Tucano and my 1/6th scale DH Chipmunk in F4B. All the models are electric powered and my cells were small enough to take on the British Airways flight in hand luggage. Nigel and Mat had to resort to ordering LiPos online and have them delivered directly to the airfield in Romania.

The team had originally included Richard Crapp, flying his glorious three engine Wessex, Roger Warman with a Tiger Moth and team manager Steve Kessel. Unfortunately, mishaps with Roger and Richard's models meant they had to drop out. Steve also had to miss the trip at the last minute due to family reasons. Team GB was a bit 'at sixes and sevens'!

Brian Seymour and Dawn Hawkins stepped into the breach to fill Steve's shoes. It was all a bit last minute but, finally, we were going to the World Championships!

Lars from Sweden dashed to Bucharest airport with Brian to collect the models. Lars refused money for fuel - what a star!

Mat Dawson's delightful Blackburn Firecrest. If we had a pound for every time we were asked what it was, we would be rich. This smaller model is a proof of concept for his larger version, which is under construction, and proves that models don't always have to be big to do well.

SHIPPING CRATES

You would think you could just knock some bits of wood together to make a crate for shipping the models, but you would be mistaken. The wood used in shipping boxes entering the EU must be certified as being free of any infestations. Plywood is fine as the process sorts out any critters! In a previous life I had cause to use road trunks to ship equipment around the globe. A quick call to my ex-work colleagues had two 6' x 2' x 2' road trunks on loan.

The day finally arrived and the team landed in Bucharest. The trunks had set off the week before overland and were sat at the Fedex building less than a mile from us at the airport, stuck in customs. To cut a long story short we had problems explaining that the equipment was on a temporary import/export and the contents were all itemised. This should not have been an issue but clearly it was. Brian, Dawn and Mat tried everything to get the trunks released and we all have extra grey hairs thanks to that exercise. Even the BMFA tried to intervene and get the models through. A call to the British Embassy was tried but that also failed to get the models released. Eventually, changing the receiver's name on the documents to Mat's seemed to unlock things.

I was walking across the airfield, having been taking pictures all day on the flightline, when Brian strolled up and said, "*We need a van, we have the models!*" I was speechless. Our friends from Sweden immediately responded and drove us in their truck to the airport to fetch the models. It is worth mentioning Mika from Finland who also offered to do the run. The camaraderie at this event was one of the real highs for me.

Up to this point I was resigned to the fact that we wouldn't get the models and settled into taking pictures for promoting the event in 2026 when the UK will host the World Championships at Buckminster. Suddenly things got real and we were indeed going to fly at the World Championships!

FIRST FLIGHT

We landed on Thursday the 8th. The event started on Saturday 10th and the models arrived at 5 pm on Wednesday the 14th. The other teams had been amazing and were very accommodating. At one team meeting they all expressed their wish that the 'Brits' be allowed to fly, no matter what.

I spent Wednesday evening frantically re-assembling my model, including the undercarriage on my Chipmunk. Static judging was scheduled for all three of us early on Thursday morning and it went okay. Our models were weighed and my pull test numbers calculated. My Chippy weighs 2.44 kg so a pull test of five times this was to be carried out before each flight (12.2 kg). Once this was all sorted, I flew my first round of F4B.

Nigel Nixon and his Tucano. Nigel flew really well and if he hadn't missed his practice flight, I am sure would have finished even higher!

Pete Bauer won Gold with his impressive BN2 Islander.

Volodymyr Maltsev's beautiful I-15 Bis Polikarpov suffered instability issues and crashed during practice.

"Suddenly things got real and we were indeed going to fly at the World Championships!"

The other teams were great and after a long absence it was nice to have the USA team back at the Worlds. They are a great bunch and all very helpful, sharing many of their observations of the rules. Pete and Kathy Bauer were very helpful explaining how they do their calling of manoeuvres, so I used their technique with Brian, who was my caller for this event as he hadn't even watched C/L before this! Well done, Brian, I couldn't have done it without you.

INTO THE SUN

The second round of F4H was under way and Mat and Nigel had been promised a flight later in the day. Unfortunately, 'later in the day' ended up being at dusk with a setting sun at the end of the runway. It was a very difficult flight for each of the GB lads, but they both just got on with it. Their next flight was scheduled for early the next morning and again they struggled with the sun, but both flew well. Alas they never got to fly their third-round flights as time ran out.

SHARED SITE

The organisers were handed a curveball at the last moment. The airfield, which although isn't strictly speaking military, does host the Romanian Air Force flying school, and it was announced that we could not have the field until after midday each day. This was a serious problem and meant that flying went on until after 7 pm each evening so that we could finish on the Saturday. Even then it was tight, with medals handed out in almost darkness.

Mat and Nigel did extremely well and we were all very proud of them, despite suffering lots of adversity. Mat's little Firecrest scored 6th highest in Static and Nigel's flying was 11th highest in Round 1. But more about the R/C event in my next column.

SILVER MEDAL

As for me, I was in silver place after Round 1 of flying. During the second round I tried a few things and increased my score slightly. With Pete Bauer scoring another top score, normalised to 1000, he was in gold and nobody could touch him. I, however, was being pressed

Torpedo away!

Roman Radionov stripped his engine's cylinder head glow plug thread. Although he spent ages trying to fix the problem, eventually he had to admit defeat when the engine stopped again in the third round.

hard by the Polish team's Fairey Swordfish, brilliantly flown by Lukasz Szeptycki in bronze position.

Before the third round I gave myself a severe talking to and wandered off to read the rules AGAIN. I spotted a few things that I thought might help and tried to find a more positive state of mind. Flight three was much better but I made a slight error on my flap demonstration, trying desperately to emphasise the aircraft's attitude during slow flight, and the score dropped to a 3 out of 10. I was worried that I was looking at a zero for the manoeuvre, so a three was better than nothing.

When the sums were done, I had hung on to second place and a nice silver medal was mine.

Allen Goff flew this lovely Nieuport 17 and although it proved temperamental on the ground it did very well, finishing 6th. The three flight judges look on.

EYE OPENER

I had never witnessed scale control line at this level before and it was an eye opener on many levels. The USA team had read and understood the rules really well. Pete's BN2 Islander was a perfect choice of subject and it had the key ingredients to do well: twin engines, high wing, trike fixed undercarriage and flaps.

The standard of modelling was really very high and the two Ukrainian Polikarpov's were stunning. Both were plagued with problems, however. I think I heard that the USA team donated an engine to help Roman Radionov compete but alas he couldn't get things working in time.

The organisers were up against it with time restrictions over access to the airfield. The main hangar was supposed to be empty for us to use too, but alas that was also not the case and it meant that the control line competitors were in a separate building. This didn't help make us feel part of the overall scale event, but I appreciate it was the best that the organisers could do.

The catering on site was good but a bit more variety would have been nice. Several of the competitors were out of action with tummy bugs, not necessarily from the catering,

> "Pete's BN2 Islander was a perfect choice of subject and it had the key ingredients to do well"

Vartolomei Kowalczyk from Romania flew this stunning Ju 87B-1.

Mike McHenry of Team USA flew his L4 Grasshopper. There were three L-4's in the scale C/L champs, two from Poland as well as Mike's.

Zenon Kowalczyk of Poland with another L4 Grasshopper (forgive me if I have that wrong!)

One of the scariest bits is the pull test. Before every flight a spring balance is attached to the handle and the modeller holds his plane while a pull of five times the model's weight is exerted on the handle, lines and bell crank. You can see I am doing my best to spread the load across the fuselage. Failure here and you are going home. My model had to pass a pull test of 12.2 kg.

A big thank you to Team USA's Ben Andrus who borrowed my camera and got some lovely shots of my Chipmunk.

Pete and Kathy Bauer showing us all how it was done. They were great company and I learned a great deal from them. Pete is a worthy F4B World Champion.

Our thanks go to Brian Seymour, our hardworking Team Manager for his support and especially for this picture. I kept the flag furled as the organisers had hung it upside down!

Volodymyr Maltsev from Ukraine with one serious looking handle. His Polikarpov was heavy and you can see he needed the harness to help him manage the centripetal pull.

but when you have been ill you instinctively avoid grilled food. It was amusing that beer was cheaper than water and lemonade was the most expensive, being twice the price of beer and more expensive than coffee. But the staff were very friendly and worked very long days to keep us smiling.

IN HAND

Some of the control line handsets seen by the competitors were interesting. Many of the European competitors still used multi-line systems of up to four lines to control various functions. Their systems are works of art, more akin to watch making. Some were still using a 'down the wire' system where insulated wires are used to carry servo position information. The main sources were Clancy Arnold in the USA or Vladimir Kusy from Czech Republic. Only the GB and US entrants were using 2.4 GHz R/C gear, which was only recently permitted under FAI rules.

Most of the C/L models used IC engines but that heavy Polikarpov used a pull start petrol engine! Only Pete Bauer and I were flying electric.

SUMMING UP

Was the trip difficult? Yes.

Was it expensive? Well, yes to that too. Romania is a fair distance.

Would I do it again? You bet your life I would! The memories and friends I met made the trip priceless.

A big thank you to my teammates who stood by me through my grumpiness, always being supportive. I will always be in your debt. Let's do it all again in 2026 when the World Championships are held in the UK.

If you have ever fancied having a go at scale control line, then please get in touch. If I can do it, then anyone can! As always if you want to drop me an e-mail, I can be reached at: **cammnut@gmail.com** ■

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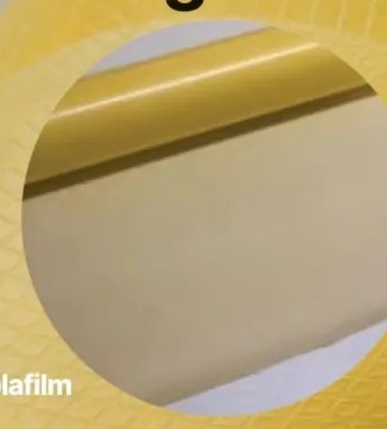

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BOULTON PAUL P-75 OVERSTRAND

Continuing from the last issue, Jon Harper finishes and flies his his 72-inch 'Nugly' bomber

Words **Jon Harper**

Photos **Chuck Clark**

Even an interwar bomber needs a bomb load, so some lightweight scale 300 lb and 20 lb bombs were made from pink foam and balsa. The 'bombing up' test fit proved that all ordinances could be accommodated.

Online research turned up some expensive vintage wheels, so I decided to make my own, but lighter. The lightweight wheels I did buy were too thick, so I used an Olfa blade to cut a 6 mm thick bagel slice off each side, followed by belt sanding to grind down the hub flush to the thinner wheel thickness. The wheel covers are thin aluminum sheet with some 3D weathering.

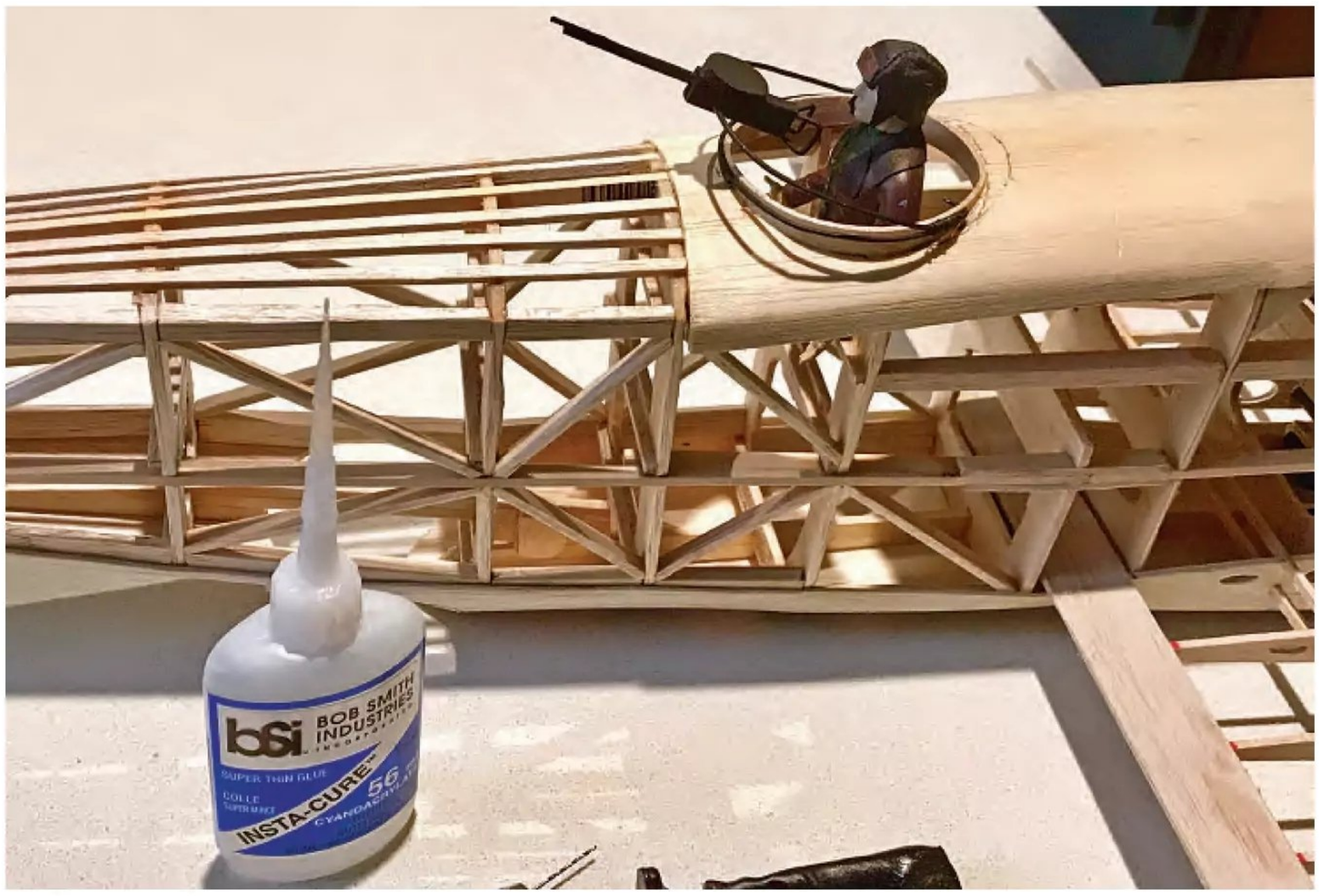
The nine-cylinder engines were made by copying a picture and gluing to 1/16 ply, cut to shape and with connecting rods added for realism.

TURRET & LEWIS GUNS

A dive into our recycling container produced a clear plastic bottle close in shape to the gunner turret profile. The shape was corrected by adding a 1/4-inch balsa base and by cutting the bottle top to create the facets. Olive green finishing trim sheets were used for the structure and green paint for the panels.

After finishing the turret, a gunner, Lewis gun and seat were installed with a rare earth magnet on the base and concealed

Close up of nose gun turret, engine nacelle, cowl and cockpit.



Lewis gun, scarff ring and gunner test fit.

retention elastic bands at the top. Three 1/12th scale Lewis guns and removable Scarff rings (for the dorsal, ventral gunner positions) were made from flexible heat shrink tubing, balsa bits, painted card for the gears and piano wire.

CREW, COCKPIT & CANOPIES

The front gunner was hatched from pink styrofoam, rough cut in two directions on the bandsaw, followed by some quick Olfa blade whittling, a rough sand and paint. The gunner is hidden behind glass so did not have to be finished perfectly. The foam pilot weighs only 2 g.

Decapitating my other aircrew (which weighed 35 g each) and gluing their heads back on carved foam torsos saved about 60 g.

The coaming was made from my wife's 'lost' leather glove. A needle was used to poke holes to represent the coaming stitching.

Card templates were cut for the front and rear canopies, which required some adjustment to get the shape just right. The templates were used to cut out the canopy acetate. Canopy structure was simulated with olive green matt trim sheets.

The scale operational generator fan was constructed to spin on its own when flying with blades bent from thin aluminum set to spin on a pin.

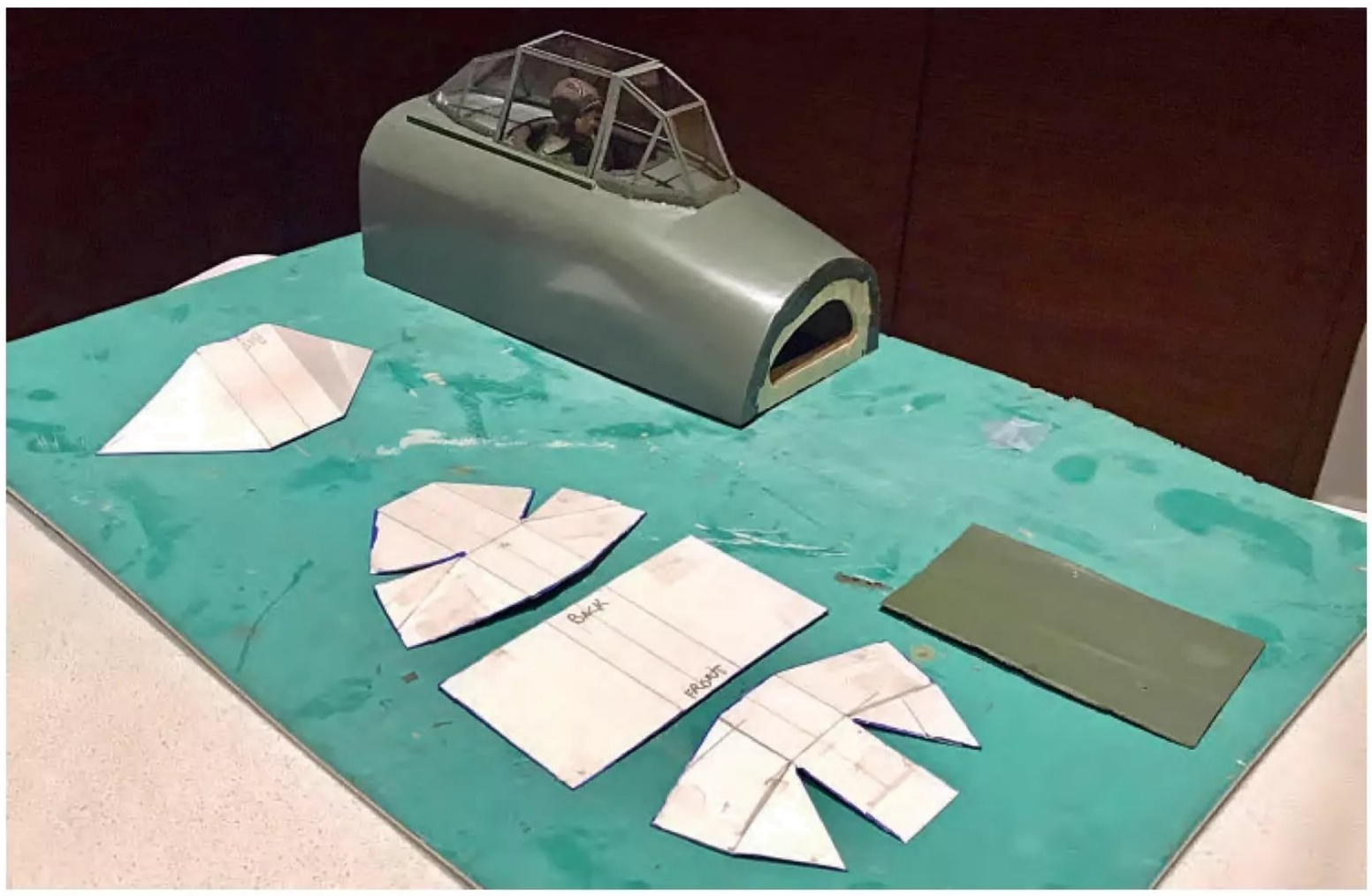
COVERING & GRAPHICS

The horizontal stab and elevators were covered in lightweight silver heat shrink film. The central wing components were sequentially disassembled and covered, then reinstalled to ensure that the struts stayed in the correct locations.

Covering the compound curves around the nose was not fun, but despite this the fuselage covering turned out reasonably well.

Gunner installed in the front turret which was made from a recycled drinks bottle.

Aircrew weighing 2 g each were hatched from pink foam. It's a very quick way to create a crew.



Cardboard canopy templates were used to confirm the shapes prior to cutting the final parts from acetate sheet.

"A dive into our recycling container produced a clear plastic bottle close in shape to the gunner turret profile"

Just as I started covering the fuselage I noticed a colour reference for J9186 on the plastic model plans. I had understood that the livery was black and silver, but it turns out it is olive drab and silver. This reminded me that I must thoroughly validate all references prior to starting. In retrospect, if you were to look at the archive prototype J9186 photos I was using for reference you would see the difference in darkness between the black number 13, the black tyre rubber and the lighter coloured top and nose of the fuselage. The fuselage covering was completed using matt olive-green heat shrink film for the top and bottom of the fuselage, and silver on the sides using the heritage photos as a guide.

Callie Graphics did a great job producing the graphics from marked up photos. I started the graphics application way too soon but couldn't resist seeing what they would look like. The vinyl decals were easy to apply using the carrier paper for alignment.

ANGLES OF INCIDENCE

Initial angles of incidence were set as follows:

- 1.5 degrees positive on horizontal stab
- 4 degrees incidence on lower wing
- 5.5 degrees on upper wing (reduced to 4.5 degrees after first flight)
- 1 degree washout in the ailerons
- Outer wings 3 degrees dihedral and 1.5 degrees of back sweep.

FINAL ASSEMBLY & BALANCE

All the parts were reassembled and checked for fit, with wing angles of attack adjusted using the flying wires and turnbuckles. I was surprised at how large the P-75 was when fully assembled in the workshop. Once assembled, with crew,

DESIGNED BY JON HARPER

BOULTON PAUL
P-75 OVERSTRAND
BY JON HARPER

PLAN No: RC3246 | No. OF SHEETS: 1 OF 4 | Plan published in RCM&M, Sept edition 2024

3/8" BALSA FIN & RUDDER OUTLINE WITH 3/32" RIBS

3/32" BALSA FORMERS WITH 1/8" LITE PLY SPINES, 1/4" x 3/8" & 1/4" x 7/16" STRINGERS

1/8" 5/16" SERVO RUDDER MOUNTED WITH CARBON RODS

ACETATE CANOPIES

FRONT TURRET FROM CLEAR PLASTIC BOTTLE

5/16" BALSA TAILPLANE OUTLINE WITH 1/16" RIBS

3/32" SHEETING

Ø3 3/4" LIGHTWEIGHT WHEELS

1/2" ALI. AEROFOIL STRUTS

COWLS COMPRISE 1/4" BALSA SEGMENTS WITH 6mm PLY MOTOR MOUNTS & 1/8" LITE PLY DUMMER CYLINDERS

NACELLES COMPRISE 3/32" BALSA FORMERS WITH 1/16" SHEETING

3/8" x 3/8" BALSA T.E. & 5/16" x 1 1/2" AILERONS

1/16" x 1/8" REAR SPARS WITH 1/16" SHEET WEBS

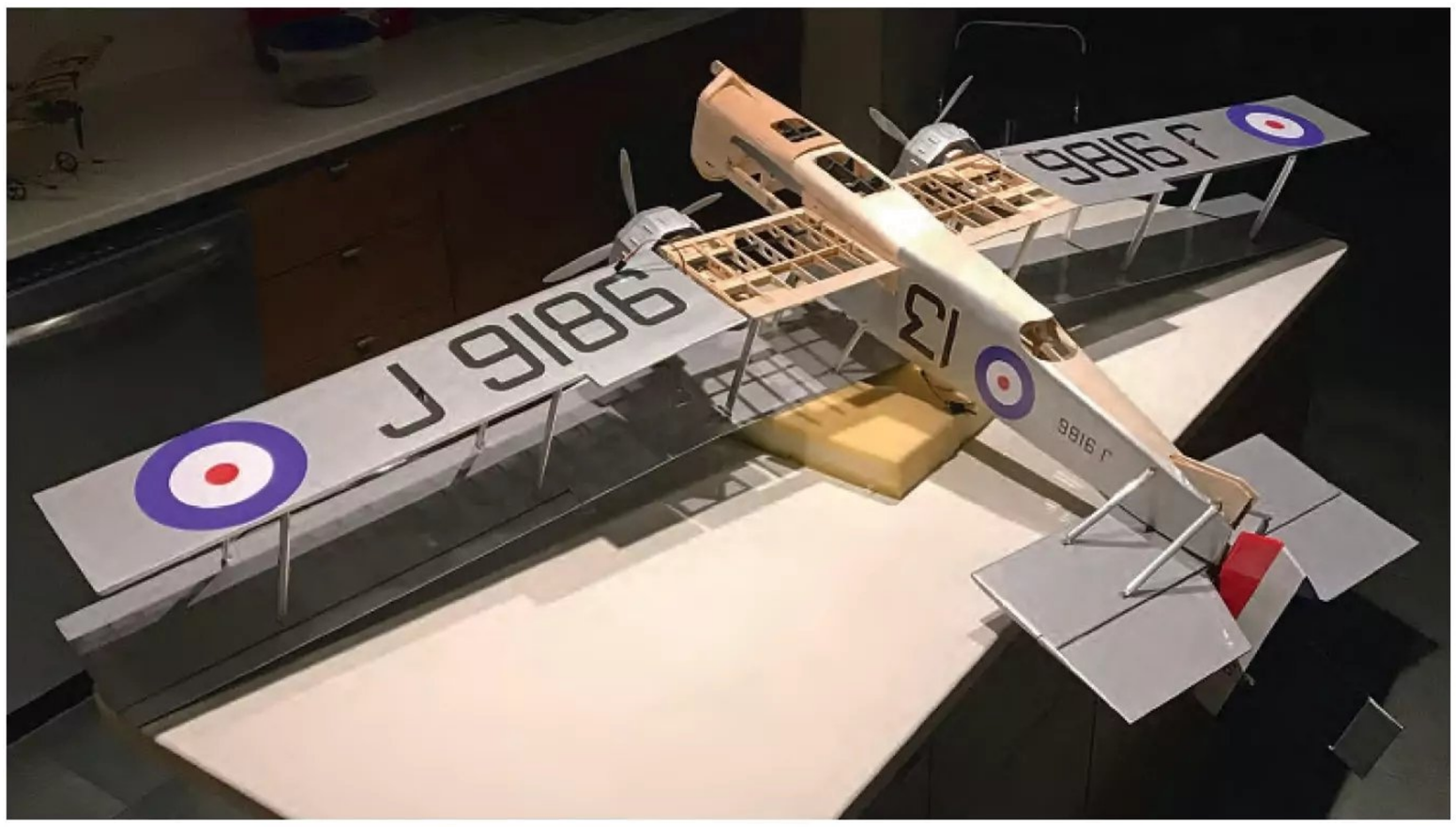
3/32" BALSA RIBS

Ø5mm CARBON TUBE

3/32" BALSA TIPS

1/2" x 1/2" BALSA L.E.

BOULTON PAUL P-75 OVERSTRAND



Final covering in progress and graphics already added. Landing gear to be fabricated and installed.

Nose structure after the test flight crash. Note the compressed turret which made a great crumple zone.

"I had understood that the livery was black and silver, but it turns out it is olive drab and silver"

batteries and all electrics, I re-weighed the plane, which came out at 6 lbs 10 oz AUW, which is quite a bit heavier than my original target of 5 lbs.

I realised that I had very little idea where the Centre of Gravity should be! The forward stagger and partially swept back wings mess up my usual 25% of the wing chord rule. After some calculations, the battery was moved to achieve a CG 35% of the top wing chord back from the centre wing panel leading edge, ensuring a nose heavy plane at worst. 5.5 oz of lead was required in the nose gunner turret to achieve this balance point, even with the two batteries stacked vertically at the front of the battery hatch. Yes, the tail was not light enough!

SHAKEDOWN & FIRST FLIGHT

Happily, the P-75 made it up the basement stairs and fitted, fully assembled, in the car. Two flying field visits were required for taxi testing during which the following was discovered:

- One motor was counter rotating erroneously
- The elevator had no up trim
- Some flying wires needed to be tightened
- CG was still slightly tail heavy
- U/C needed adjustment to fix a left pull during the take-off run
- General ground handling characteristics were excellent
- Control sensitivity needed to be reduced

After two weekends of taxi tests and adjustments I decided that the P-75 was ready for a flight trial. It turned out to be quite a crosswind, so I had to use our alternate runway, which was further shortened due to flooding. This required

A good illustration of the plethora of scale flying wires.

Take off roll requires a large amount of right rudder to counteract the propeller gyro effect. I would highly recommend using counter rotating props to dumb this down.

Close up of rear of engine nacelle and tail gunner position. This shot also shows the tail configuration and diagonal structs below the horizontal stabiliser.

The rear gunner peeks over the edge to see where the bombs are landing.

Scan this QR code for construction shots and views of the Boulton Paul P-75 Overstrand.

> "Gentle circuits, figure eights, touch and goes, and low, slow passes are the order of the day"

gunning the throttle... It was a short three second 'flight' ending in a spontaneous wing over and nose in.

Lessons learned:

- Don't gun the throttle. Stay on the ground and gently build speed
- Don't try to take off on a short runway
- Don't fly if there is a crosswind and only fly if it is quite calm
- Make sure the camera man is ready and rolling...

The fuselage nose and bottom central wing had to be replaced. The rest of the fuselage, outer and upper wings, and the entire tail were all fine. The central wing on the left side appeared to have disintegrated on impact and the carbon fibre wing spar had broken. The front of the fuselage also took a beating and it appeared that the monocoque sheeting also came off the structure, allowing the fuselage to bend but not break.

The gunner's turret took much of the impact, functioning as a 'crumple zone'. Having been surgically glued together shortly after the crash, rumours of the gunner's demise were greatly exaggerated.

SUCCESSFUL FLIGHT TESTING

Reconstruction of the lower wing panel was not too difficult. The demolished wing panel was glued together as a template to accurately locate the myriad of fastening points.

After three weeks of repairs it was off to the club field for another go. This time the P-75 flew, completing a 3.5-minute wild ride back to terra firma. It appeared to be tail heavy, did not want to turn to the right much, and was extremely throttle sensitive, zooming up with throttle.

Flight video was used to diagnose causes and suggest remedies. The upper wing angle of attack was reduced to 4.5 degrees, another ounce of lead was added to the gunner turret (now containing 6.5 oz of lead) and the motor thrust angle was adjusted downward by a degree or so.

Subsequent flights have been quite satisfying, flying within a very tight throttle range due to the significant drag. Full throttle is not desirable, while landing requires part throttle until on the ground. Flight controls are slow to respond; you must apply the control and wait for a second for it to start to turn.

No aerobatics for this flying machine! Gentle circuits, figure eights, touch and goes, and low, slow passes are the order of the day - much like the real machine.

ACKNOWLEDGEMENTS

For these builds I rely on others, so I wish to thank the following.

My wife, who lets me build in the dining room and kitchen. Chuck Clark for his photographic skills, my RCGroup online friends, Dave from Great Hobbies, my Stetson clubmates (always ready with advice) and Kanata CNC Models for the 'ribbery'. ■

DATAFILE

Name:	Boulton Paul P-75 Overstrand
Model type:	Scale biplane bomber
Scale:	1:12
Designed by:	Jon Harper
Wingspan:	72" (1829 mm)
Weight:	6 lbs 10 oz (3 kg)
Wing loading:	21 oz / sq ft
Functions (servos):	Ailerons (2), Rudder (1), Elevator (1), Throttle (ESC)
Motors:	2 x E-flite Park 480, 250W, 950kV
ESC:	2 x 30A
Props:	2 x APC 11 x 6 four blade
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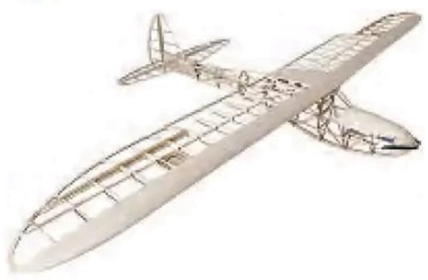

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MORE DOPPLEGANGERS!

For the September issue, Jeff Barringer sent in a wide selection of pictures of his DB Autogyros built by him and his Northampton MAC clubmates. Unfortunately, space was too tight to do justice to Jeff's pictures, so let's try again...

WATCH THE BIRDY!

Here's John Freeman with his Eagle which he 3D printed from files available from the planeprint.com website. John's bird has a two-metre wingspan and weighs in at 1250 grams. It uses a hybrid construction method of PLA and LW-PLA (Lightweight-PLA).

TONY CROSSOVER

This is my 'Tony' fun fighter built in the summer of 1996 from a free plan in Radio Modeller. It was a Chris Golds two channel design for a Cox .020.

The trouble was that I couldn't get the engine started (Chris recommended a small electric starter, that I was unable to make). It sat for years on a shelf with bits falling off as the balsa aged, until last year when I cut off the front and fitted a small electric outrunner, as suggested by 4-Max. It flies surprisingly well and with power off it glides well too, it being so light.

As a consequence, I have started a second one, modifying the plan to look like a Macchi 202 Folgore, which had an almost identical planform and size. It also used the same Mercedes DB601 engine. Naturally, the Italians used far fewer straight lines, with more elegant and subtle curves and they set the pilot further back. As with the Tony, the Macchi had lots of interesting colour schemes.

Mike Powell

RUTTER FURY

This model was built off a free plan from a while ago. 1980s, I think! It's a Hawker Fury designed by John Rutter. Originally powered by an O.S.10, it was recently retrieved from the loft and electrified.

Martin Wood

Spot on, Martin. John Rutter's 32" Fury plan was originally published in the March 1986 issue of Radio Modeller - **KC**

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WESTON PARK MODEL AIRSHOW

Despite some monsoon like weather the hardy display pilots at the annual West Midlands show kept Mike Freeman busy taking pictures for his show report, aided by his brother Al

Words **Mike Freeman** & Photos **Mike Freeman, Al Freeman**

Steve Bishop and his team have been running the Weston Park Model Show for 27 years and they seem to have got it off to a tee as, once again, they had bagged some impressive models and pilots for this year's displays along with a substantial trade presence. The only thing they couldn't control was the forecast and this year's show was treated to some weather of biblical proportions, especially on the Saturday, including wind, rain, hail and thunder. The sun did show up between the showers so it wasn't a total washout. The brisk wind was often turbulent and crosswind thanks to the trees lining the runway so it was not ideal conditions for flying. A mere mortal would have seen the conditions and gone home but the Weston Park show pilots are a hardier breed. As long as they were able to keep their transmitters dry they were quite happy to plough on. As far as they were concerned the show must go on - and what a show it turned out to be!

Steve Kilbon (left) and Oliver Allcock shelter from one of the heavy showers. Within minutes of the rain easing Steve had the Me109 fired up and in the air.

Show stopper! Prototype 1:4.5 scale F4 Phantom from CARF Models.

Darren Goule was back again with his GP176 powered 50% scale Pitts Challenger. Such a photogenic model.

Jase Dussia's party piece was to fly a complete circle with one wingtip of his Flex Innovations Edge 540 sliding along the ground. He did this several times over the weekend along with other fabulous 3D antics.

Nicolas Gastaldi gave us a masterclass in 3D jet routines with his Ares XL which is powered by a Kingtech 320 turbine with vectored thrust.

There were more 3D helis showing this year. This is Raquel Bellot's soXos Strike 7.1 trimming the strip.

Several of the Freestyle slots included two or more models dancing together.

CARF Models Andreas Gietz (front right) and Max Chrubasik (front left) carry out pre-flight checks on their prototype 1:4.5 scale F4 Phantom which was about to take to the air for the first time in the UK.

CARF Phantom on a fly-past. It looked simply stunning!

Sadly, the F4's nose leg came a cropper a few minutes later. CARF have already beefed up the leg's design ready for production.

Steve Johnson's Skymaster Jets F-14 Tomcat put on a lovely scale-like display, shown here on a swept wing high speed pass.

Tomcat makes a safe return. Note the working LE slats and the drooping arrestor hook.

SKILLS

I consider myself a capable pilot, able to fly a model where I want it to go, but I was in total awe of the aerobatic pilots showing off their skills at the show. The way they turn their models inside out was a real crowd pleaser. There were several Freestylers and 3Ders visiting the flight line throughout each day, with a few more helicopters showing this year. Static photographs don't really do the flying skills justice but close by are a few to show the calibre of models and flying skills on show.

HEAVY METAL

There were some impressive scale jets. The first was an actual showstopper as everyone on the fight line was asked to move right back to the spectator fence as the prototype CARF Models F-4 Phantom taxied onto the strip for the first time on British soil. This impressive 1:4.5 scale, 2.65 metre span model, flown by CARF boss Andreas Gietz, looked superb as it took off with its super bright LED afterburners glowing for effect. It is powered by two Kingtech 235 G4 turbines each supplied from its own dedicated five litre tank of diesel with duplicate R/C control from a Jeti RC Centralbox 210 and Cortex Pro 3-axis stabilisation system. Take-off weight is up to 50 kg and it looked simply awesome carving up the sky over Weston Park. Sadly, the model suffered a damaged nose leg on landing and didn't appear again at the show. Andreas told me they are beefing up the nose-leg design before going into production. They are committed to fully testing their models before releasing them to their customers.

Paul Metcalf's EE Lighting was flown by his son Luke in a polished scale-like display.

It took Paul 18 months to build and finish the Airworld Modellbau EE Lightning. Close up you can see why! Detailing is sublime.

Steve Kilbon with his third scale model of the first British turbojet powered plane, the Gloster E.28/39.

Steve Kilbon's Gloster E.28/39 on a beat up along the strip.

The Gloster jet gets away after another heavy rain shower.

Next to take to the air was Steve Johnson's 1/5 scale F-14 XXL with a fully functioning swing wing and leading-edge slats. This model is from the Skymaster Jets kit and was built by Steve Elias. It is powered by twin Kingtech 260 turbines. Steve gave us an enthralling display with several passes with the wings swept and then out straight for a scale landing with the arrester hook deployed.

The final big scale jet was Paul Metcalf's 1/6 scale English Electric Lightning flown by his son Luke. It took Paul 18 months to build the model and when you looked at the attention to detail you could see why. Paul told me the pilot of the full-size Lightning XS921 had seen the model, got in touch with Paul and gave him lots of insider information on the aeroplane, including a look at his logbook. The 1.76 metre span model is from the Airworld Modellbau kit and is powered by a B300F turbine, tanked with nine litres of fuel via twin 4.5 litre tanks. Luke gave us a memorable display with several high-speed passes which reminded me of seeing a full-size Lightning at the Fairford Airshow umpteen years ago!

EVOLUTION

The gas turbine models at the show gave us some spectacular displays but they wouldn't have been there if it hadn't been for the exploits of inventor and pioneer Sir Frank Whittle who invented the turbojet engine in the 1930s. Steve Kilbon from Lincolnshire had brought along his scale model of the first ever British turbojet powered plane, the Gloster E.28/39, which first flew in 1941. Steve's model is to third scale with a wingspan of just under three metres. He acquired the part built model last year and

There was a good crowd on the Saturday despite the weather forecast.

Commentator double act John Tancock (left) and Martin Painter kept the crowd entertained with facts about the models flying, interspersed with interviews and banter.

One of the Cambria Funfighters makes a dead stick arrival in the rain.

J Perkins had a queue of pilots line up to fly their Arrows Mini Jets. Riley Howe (left) and James Lancaster of the RJ Aeroteam were first to grab a little EDF to fly in the J Perkins slots.

Flex Innovations had some pretty serious 3D models showing but they also had Clubman models too. Here's a small selection.

added a JetCat 120 turbine, a 3.5 litre fuel tank and a Robart Air System serving fully custom-made trailing arm retracts. She weighs in at 26.5 kg which includes 2.5 kg of lead in the nose to achieve the desired CG position. Steve treated us to a splendid scale display. He told me she is docile to fly with no nasty habits despite that rather vicious looking wing taper!

SOMETHING FOR THE WEEKEND

Weston Park isn't all about the jaw dropping Labours of Love and Unobtainium, oh no! There were several retailer slots showing off models for club fliers to see flying. Both foamies and balsa kits were on show, and most were available in the trade tents for modellers to buy or order.

I particularly enjoyed the J Perkins slot where pilots at the show were invited to fly a range of kits including Panic bipes and several Arrows Marlins, Sabres and Hawks in a mass flying melee. A particular treat was when they tried to fly their models through a gap between two bushes on the opposite side of the strip. It wasn't until the pilots went to collect the wreckage that you could see what a challenge it had been. I'm sure I saw at least one make it through!

Cambria were back with their Funfighter squadron engaging in another airborne extravaganza, flying simultaneous circuits and aerobatics with their traditional balsa and ply built models. Flex Innovations also had a packed slot with various models from their range being put through their paces.

Other manufacturers displaying were IAD Models and TomJets from Austria, both showing off their turbine and EDF clubman models. Sadly, there were no worthy photos this time. Sorry guys!

SYNCHRO PAIRS

There were a few slots with pairs of planes flying in formation. The Reds Duo Team of Steve

'Reds Duo Team' Steve and Matt Bishop with their Red Arrows Hawks.

Ralph Losemann (left) and Enrico Thäter from the Elster Jet team prior to their Sukhoi SU-30 duo display.

Nathan Rigby and dad Andy alongside Nathan's Flex Innovations 104" Edge 540.

and Matt Bishop gave us a polished display emulating the full-size Red Arrows Duo Pair. Sadly, this year is the last for this pairing.

Azza Stephens and Sonny Millgate from AZ Aerosports were flying their massive 60% size Cubs, including a daring mirrored fly-by down the strip. Each model has a wingspan of 5.4 metres and is powered by a 420 cc four-cylinder engine.

Enrico Thäter and Ralph Losemann of ElsterJET in Germany were back flying their scratch built Sukhoi SU-30s, with vectored thrust enabling them to pull off some amazing manoeuvres.

SAFE HANDS

It's great to see youngsters enjoying this wonderful sport of ours and it's even better seeing them promote model flying at model shows like this. There were three of them displaying at Weston over the weekend.

This year was Finn Hennessy's first time displaying at Weston and he wasn't daunted by the experience at all. He flew some Freestyle/3D slots and a rather feisty Tomjets Squall 70. With its 70 mm EDF, 6S 4000 mAh LiPo and a wingspan of just 755 mm this was a proper pocket rocket but Finn handled it just fine.

Azza Stephens and Sonny Millgate gave an elegant close formation display with their 60% Cubs, each having a wingspan of 5.4 metres.

Ralph put his SU-30 into a vertical dive with its air brakes deployed and pulled out into a low level fully braked pass. Note the twin rudders in opposition and raised wing TE air brakes as well as the obvious hatch brake.

Young Finn Hennessy flew a few models including this feisty Tomjets Squall.

Young pilot Joe Hampson rushed hot foot from two GCSE exams earlier in the day to fly his Pilot-RC Extra NG 103" at the show.

The J Perkins trade tent was well staffed. Here are some of them along with some of the show pilots. A friendly bunch!

One of the smaller traders was Modern Vintage Models with some classic model kits for sale manufactured using up to date laser cutting.

Weston's 'Ring of Fire' was back! The Fire Monkey Pyro Team's explosions were immense.

Adam Broomhead's 44% Pitts Challenger V1 on a Farnborough Pass. It's a built-up kit from Skip Models and has a DLE 120 up front.

Steve Kilbon's 1:4.5 scale Fly Eagle F-16 in Royal Thai Air Force 100th anniversary display colours pops nicely against the Weston Park trees.

Max Chrubasik from CARF Models performed a splendid display with this half scale FlyBaby.

The youngest flier at the show was 11-year-old Nathan Rigby who was another regular visitor to the Pilots' Box. Nathan is already an old hand at display flying. He's been flying since the age of five and did his first show aged eight! Mind you, when your dad is an accomplished show pilot, Andy Rigby, I suppose Nathan's progress was inevitable! Nathan gave us a polished Freestyle/3D display with his Flex Innovations 104" Edge 540 powered by a ZD 140 cc engine spinning a 29 x 10 carbon prop. Nathan also joined in the J Perkins mass fly slots over the weekend.

Finally, Joe Hampson turned up at about 4 pm on Friday having just completed two GCSE's exams during the day! He was so keen to get flying he was still in his school uniform as he swung the 28 x10 carbon prop to start the DA120 engine of his 103" Pilot-RC Extra NG. He was allowed to take his tie off though - for obvious reasons!

After his brilliant display I asked Joe how he flies manoeuvres like a rifle rolling loop. I asked him if the controls were pre-programmed at the touch of a button but he said, no, it's all down to practice and muscle memory. He tries to get three hours of practice per day. There's dedication for you!

TRADE VILLAGE

The trade tents were arranged around the rear of the spectator area allowing visitors to conveniently pop in and out whilst watching the displays. I saw lots of folk walking round with boxes of various sizes containing new projects.

There was a healthy trade in second hand models and gear at the swap meet enclosure too.

It was also encouraging to see people walking about with stacks of balsa. It looks like balsa bashing still has a healthy following!

OTHER ATTRACTIONS

There was a lot more going on at the show. The 'Ring of Fire' slot was as entertaining as ever and the night flying slots were quite surreal with models having lights rigged on their wingtips and others with internal lights. Helifest was there for 'coptor fans and there was a Drone Racing course too. There was a Fun Fair for the kids and plenty of food and drink retailers to keep everyone fed and watered.

To complement the model flying there were some full-size slots throughout the day. There were a pair of jet powered para gliders and some formation displays including an atmospheric duo display by two Grob powered gliders flying a night time sortie with lights, pyrotechnics and aerobatics.

There was the traditional end of show fireworks display on the Saturday. To be honest I thought this might have been rained off - it was bucketing down! The Fire Monkey Pyro Team soldiered on and gave us a stunning display.

EYE CANDY

It never ceases to amaze me the quantity, quality and range of models Steve Bishop and his team manage to attract over the three days. Al and I took thousands of photos on the Friday and Saturday we were there. I've culled as many as I could but still ended up sending more to Kevin than he could possibly use so I'm going to let him choose - if he has any space left! The captions give the details. Enjoy! ■

Top letter

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

FLYING WITH BIRDS

It is a shame that the great images of the Red Kite showing an interest in the Dancing Wings Buzzard have generated negative comment which doesn't seem justified.

As a retired professional ornithologist, I have for many years taken a special interest in how birds interact with our flying models. Our club flying sites are close to RSPB bird reserves and special conservation areas for birds so there are always plenty of wild birds around as we fly.

The best way to describe the wild bird/model interaction is 'disinterest'. Most birds take no notice whatsoever and a few show a passing interest. Small birds like Skylarks show no interest and waders, gulls and geese (in our case Brent and Canada Geese) take no notice either. Birds of prey like Buzzard, Red Kite and Peregrine Falcon show occasional interest but this is usually just checking out the model in passing with nothing at all sustained. On our local slope site, we often share the airspace with Buzzards and Red Kites using the same updrafts as we are. The Red Kites are the most inquisitive but never stay with the model for long.

I have checked the research literature and there is nothing published that I can find on models disturbing wild birds. There is quite a bit of work on disturbance from drones and there is some guidance published on approach distances etc. In these studies, breeding birds reacted less to drones than wintering birds. Model fliers are often asked to avoid sensitive sites like nesting cliffs during the breeding season which is clearly a sensible precaution.

On the dark side, there are also some reports of malicious use of drones to deliberately disturb nesting Peregrine Falcons. Interestingly organisations such as the RSPB now routinely use drones to count nesting Herons and seabirds because they get better counts that way and this is far less disturbing than sending human observers into the colonies.

Research into the impacts of disturbance of all kinds on wild birds is extremely difficult to do. What is clear is that the impacts are species and context specific and are often counter intuitive to us humans. I don't know the context of the Red Kite images you published but it looks to me that the bird was simply checking out the model and I guess it soon lost interest and moved on.

Ken Smith

I have just read your Welcome article in the latest RCM&E regarding birds and models. I am both a model flyer and a bird watcher, having carried out both hobbies from my early teens, and was saddened about the reaction of one of your readers

I have witnessed on several occasions Buzzards quite happily floating about with model aircraft without any issues. I suspect if the Red Kite was threatened by the model, it would have attacked and hopefully the pilot would have landed.

As a matter of interest, I have a VQ Twin Otter which is bright yellow and last year I was followed round two circuits by an Oystercatcher which stayed at the same distance all the time. If you observe Oystercatchers you will often see groups of two, three or four birds flying around in apparent formation, so I didn't see a problem.

To make another point, birds aren't stupid and are usually quite good at perceiving what is and what isn't a threat. I have yet to see crows mobbing a model aircraft, bird shaped or otherwise. I suspect birds are more at risk from errant models being retrieved by owners than anything else.

David Heaton

A reply to your comments regarding flying close to Red Kites. At our club's flying field in north Bucks this is a common event. The birds are typically specks in the sky, at least half a mile away when we start. They then often close in when we start flying. It is not rare to have three or four birds flying in close proximity and very nice it is to see. It happens right through the year, not just in the breeding season, so I do not think your complainant is correct in his assessment of the bird's behaviour. Also, I have never seen any signs of aggression or retaliatory behaviour from them, suggesting they do not consider the planes to be a threat. I have always thought the likely situation is that the birds spot the planes circling from a distance and think they are other birds (similar in size) circling over a possible food source (dead rabbit?) and come to investigate. We used to get similar behaviour with Buzzards, but these are far less common than they were before the Kites arrived.

Your complainant is obviously entitled to his opinion. If there was any evidence to support it, I would agree we should do something to change the situation, but I genuinely think he has misread things. There is one Kite which often circles over the pits area at a height of about 30 feet. Not the behaviour of a frightened bird!

Jeff Bell

Thank you for your messages, Ken, David and Jeff. Your experiences of flying with birds does seem to match my own, and others who have responded about this topic. In a further email from the original correspondent, I was given contact details for a lady called Katie, one of the RSPB's Supporter Advisers on their Wildlife Team. So, I wrote to her to explain that model flying with birds was a common occurrence and in her reply she passed on some useful advice:

We completely understand with a hobby such as this that birds can often show an interest, so I am pleased to hear you take it seriously and want to try and educate model fliers further.

It might be worth reaching out to a County Bird Recorder, who will be local and be able to advise on disturbance, especially if there any recorded Schedule 1 species nesting in the area. With nesting Schedule 1 species this is where disturbance can be a legal factor when they have an active nest and the recorder should be able to see whether any are in local areas which need to be avoided. If you are interested in reaching out to a County Bird Recorder they can be found here: **https://www.bto.org/our-science/projects/birdtrack/bird-recording/county-bird-recorders**

We hugely appreciate you taking the time to reach out to us and also ensuring the safeguarding of birds with model fliers. It sounds like you are doing a fantastic job so thank you.

Katie also sent me a PDF leaflet called 'Birds and the Law' but I cannot find an online link for it to pass on to any readers who may wish to view a copy. The most important thing to be aware of is the main law that protects wild birds in the UK, the Wildlife & Countryside Act 1981, details of which you can view here:

https://www.rspb.org.uk/birds-and-wildlife/wildlife-and-countryside-act

KC

kcrozier@mortons.co.uk

FOURNIER FOLLOW UP

A friend of mine has just sent me a copy of page 64 of RCM&E, August 2024 (Bickley Glider Day report) with a picture of a model of my RF4. I was really looking forward to seeing it as I'd not heard of anyone making a model of LZ, although there are a few of my friend's G-BXLN around. How disappointed I was to see that it has an incorrect paint scheme when the owner has obviously put a lot of time and money into the model and presumably gets a lot of fun from flying it.

I couldn't make Keil Kraft models as a kid as my parents wouldn't let me have the bigger and easier to make ones, so I missed the flying model stage, going straight from Airfix to real aeroplanes, getting into maintenance about 25 years ago and buying LZ at the same time.

Originally LZ was red and was getting quite tatty so in October 2005 it went into the workshop for a strip and re-fabric. Although I worked for a well-known glider mender at Nympsfield (Roger Targett) at the time this was my first solo job in another workshop, with Roger signing it off, as at that time I wasn't an LAA inspector. It was painted blue as the first RF4 I had seen as a kid and fallen in love with, G-AVNY, at Pershore in '73 was the same blue. At the time the scheme was purely from memory and a few bits are slightly wrong, but not that

anyone other than a complete Fournier anorak like me would spot.

There are many pictures of LZ on the net and Fournier owners are very welcoming to anyone who wants to build models. I'd love a Mick Reeves RF4 but it's far from cheap and I'd probably mess it up, let alone be brave enough to fly it.

Over the years I have refurbished a fair number of the UK Fournier fleet, including N1700/G-RFAD and G-AWEL which were still sporting their original factory paint schemes. So, I have been able to accurately measure the curves and size and spacing of the stripes etc. which I'm happy to make available. Currently I have the prototype RF5 and an RF4 project on the go.

If any of your readers are making, or thinking of making Fournier models, they are more than welcome to contact me on limazuluservicesltd@gmail.com to talk Fournier.

Dave Bland
Owner G-AWLZ & Lima Zulu Services Ltd

Brandon Ransley's Leader G caught in flight.

F3A EURO CHAMPS

The F3A European Championships were held in Grandrieu, Belgium in July this year. Team member Malcolm Balfour reports from this highly competitive team event

Words: **Keith Jackson, Malcolm Balfour**

Photos: **Keith Jackson, Malcolm Balfour, Jean Michel Coulon, Christophe Paysant Le Roux**

The F3A European Championship was hosted this year in Grandrieu, Belgium from the 21st to 28th July.

The UK F3A team, comprising Thomas Davis, Malcolm Balfour and Brandon Ransley, travelled to the club site run by the Association Aéromodéliste du Sud Hainaut (AASH) in Grandrieu, Belgium. This was the location of a previous European Championship in 2018 and the club is well versed in accommodating these large team competitions. Also joining the team were Team Manager Adrian Harrison and Chief Judge Alan Williams.

The following report was gratefully received from Malcolm Balfour. For those interested in more detail about the competition the event website is: **https://www.ec-f3a-2024.be**

TRIP PREPARATIONS

Preparation for an event like this starts at least a year before the actual event commences. The UK F3A Association holds a Team Trial event where the best F3A pilots in the country fight it out for the three places to represent the United Kingdom on the international stage. This year the pilots were myself, Malcolm Balfour, a lifelong aeromodeller having dedicated

UK Team at the 2024 European Championships. Left to right: Malcolm Balfour, Adrian Harrison (TM), Thomas David and Brandon Ransley.

"I had to navigate through the Netherlands, across to Belgium, then to Sivry, a small town close to the French Border"

Some events in the past have required me to travel by air which adds extra layers of complexity. This time around the travel was a little more straight forward in terms of packing as I would be taking my own car packed with my planes and equipment. I would be leaving my home city of Glasgow and travelling roughly 300 miles to the port of Hull where I would board the 'Pride of Rotterdam' for a 12-hour ferry journey to the Dutch port of the same name. This mode of transport worked well and I enjoyed having a good break from driving, being able to have dinner, then have a good night's sleep before my onward journey on the continent. Driving from Rotterdam, I had to navigate through the Netherlands across to Belgium, then to Sivry, a small town to the west of the country, very close to the French Border. Overall, the journey went smoothly and was really quite enjoyable.

I always like to try and soak in the different cultures when I am competing in these various events. A lot of aeromodelling events, including this trip to Sivry, take you off the usual tourist routes and perhaps allow you to experience a more authentic viewpoint of a different culture. As you would expect the AASH Club members were all very welcoming and from the start of the event we were well taken care of, allowing us to relax and focus on competing as best we could.

Malcolm Balfour with his BJ Craft Epilogue / Plettenburg Advance motor. Finished 23rd.

many years to F3A and I have enjoyed success nationally and internationally. Next was Brandon Ransley, who returned to F3A in the United Kingdom a few years ago having had several years away but who quickly made his way back up the ranks. Thomas David made up our third pilot, being a formidable competitor, pioneer of the 'Flight Coach' system and an all-round excellent pilot. This, to my mind, was a very strong team and we were all enthusiastic to be competing alongside each other, ably assisted by our Team Manager, Adrian Harrison.

I have represented the UK now three times and every event has been quite different, but all were very enjoyable. In representing the UK I have been to Poland, Spain and this time Belgium.

The preparations, once being selected for the Team, normally start with an online video call to start getting the wheels in motion on how we are going to best approach the challenge at hand. A lot of this initial preparation is looking at the location we are going to and the logistics for each pilot to travel there with two large F3A aerobatic aircraft, equipment and the usual clothes etc. required for a trip lasting close to two weeks.

Model processing was carried out by the members of AASH who were incredibly dedicated to running this and previous events. They run them very well!

The Dutch team undergoing model processing where weight and dimensions are checked against FAI limits.

COMP & PRACTICE SITES

The competition site was at the AASH Club, which has been established for over 50 years. They have a sizeable grass runway and they had erected a number of marquees for judges, catering and the processing of models. This was all organised by the club and a group of enthusiastic volunteers - what a fantastic achievement! In total there were 18 teams competing and close to 60 pilots. Each pilot must qualify in their home country before being allowed to compete in the Championships, so the standards are extremely high!

Part of the enjoyment of an event like this is being able to see the very best in the sport fly to the best of their ability. You can also learn so much from just watching how they fly and their approach to preparation. All the top guys commit a huge amount of time to aeromodelling and their attention to detail must be meticulous to allow them to challenge at what is the pinnacle of this sport.

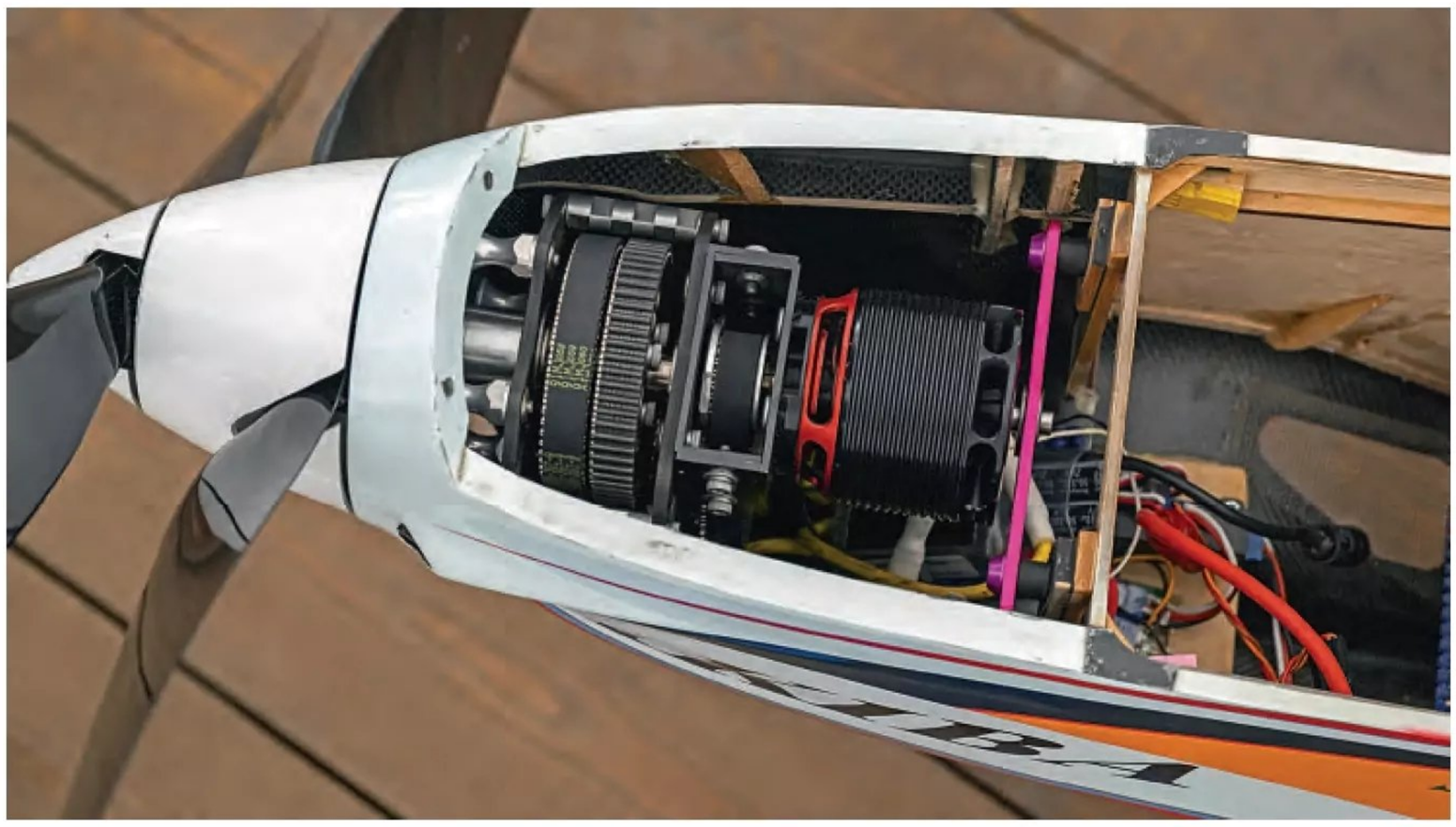
All the UK team members made it safely to Sivry and we had two days to practice before the start of the first round. There were several different practice sites available; some were very good, others not so good. The challenge was finding one not too far away and not too busy with other competitors flying. Our main practice field was at Club Havay, roughly 35 minutes' drive from the competition site. It was nicely busy, with some of the top competitors also there, but it also provided a good opportunity for us to get enough flights completed to get really dialled in before our competition flights. Importantly, it was the same orientation as the competition site so the wind direction etc. when practicing was similar to what we would have to contend with in our competitive flights.

HOT, HOT, HOT!

The first few days were very, very hot in the low 30 degrees Celsius. This may sound nice if you're on holiday situated beside a nice pool but when you are out at a flying field with very limited cover it is quite intense, particularly for my

Derk Van Der Vecht, who won the UK World Cup event at Buckminister earlier this year, placed 11th overall, narrowly missing the Finals by 7.7 points in 2000!

Derk's Hui Yang Ascent biplane was powered by the unique D3 contra drive system from Adam Dubowski.



Contra drives were used by the majority of competitors, with this pilot showing very good taste employing an Akiba contra drive!

"…all your flights are timed and must finish within eight minutes, which can be quite tight depending on your flying style"

Scottish skin! We had an enjoyable two days of practice and team morale was high.

The first obstacle to get through is model processing. This is where all the models are scrutineered to make sure that they are within the FAI regulations for F3A competition. The physical size, weight and identification markers of your plane are checked. In addition to this all your

Top Italian pilot Andrea Cervi placed sixth overall with his own design Soluna.

Close up of the front of the Soluna showing an unusual approach.

Pierre Encognère from France flew this Nexus biplane from Pegasus Composites, powered with an Adverun contra system.

Older designs were apparent, including this Oxai Galactika powered by a YS 200s four stroke and flown by Swiss pilot Marc Rubin to eighth place overall.

CK Aeros Apollo, designed by Joseph Szczur and flown here by Spanish pilot Luis Eduardo Ortega Gavilán.

Unusual wing tip detail on Christian Paradela Garaloces 'Falco Bionik'.

The Spanish team placed second overall. Juan Rombuat (second from right) placed fifth with his BJ Craft Stratos / Dualsky contra drive.

flights are timed and must finish within eight minutes, which can be quite tight depending on your flying style. They also check the voltage of your flight batteries before each flight. It doesn't sound like a big deal, but it all adds to the extra pressure you feel on the competition flightline. All our planes passed inspection. After this the flight order was chosen at random. From this we knew what time of day we would each be flying and, generally, if you were not due a competitive flight in the next few hours you would be out at the practice field getting used to the prevailing weather conditions and keeping on form.

THE COMPETITION BEGINS

The club held an opening ceremony for all the competitors and supporters. This involved each country having a small portion of their national anthem being played whilst that nation's pilots walked forward holding their country's flag. There were also some speeches from the organisers and the local mayor welcoming everyone to the event. To my disbelief the music provided for raising the flags was by none other than live bag pipers - it made me feel right at home! Afterwards there was some light food and it was an enjoyable opening ceremony.

By now we could really feel the pressure ramping up, knowing that the all-important first round was imminent. This is the flight you need to use to hit the ground running and show the judges how well you can fly. Each day one full round was flown for all the competitors.

I was to fly later the first day, so I took a trip out to the practice field and had a few flights to get used to the weather conditions, which had now changed from sunny to cold and windy, the early morning flights having been delayed by low cloud.

Thomas David was our first man up and he was pleased to put in a good flight. All the judges use what is called a Notaumatic scoring system, which is essentially a handheld computer for inputting scores for each manoeuvre such that the scores are ready immediately at the end of the flight. Indeed, you can see each score the judge gives in real time, adding a sense of excitement to the competition. Thomas' first score was not quite what he was hoping for so he would have to dig deep, keep his focus and look ahead to the next round.

The first four rounds are what are called the Preliminary rounds. This is where all pilots fly to determine who should progress onto the next stage of the competition, the semi-finals. The semi-finals are for the top half of the competitors and it is very difficult to get yourself into this top bracket of European pilots. Indeed, it is very much a 'feather in your cap' if you can achieve this.

My first flight went well; not my best but it was a solid flight. Again, the score was lower than what I was hoping for. The judges were certainly hard to impress!

Brandon flew last out of our team in the first round and he performed well and received a deservedly high score. Brandon is one of these pilots whose effortless style presents well and makes it easy for the judges to award high scores. After all the judges are only human.

It is worth noting that we had our UK Chief Judge at this event, Alan Williams. This is the first time in several years that a UK judge has been in attendance and this is important for bringing international judging and flying standards back home and applying them to our domestic competitions.

TOP THREE

From watching the first round we could see there were three pilots who were in a class of their own. This included the current World Champion Lassi Nurilla who had travelled from Finland to compete in this event. Lassi competes with his own design and manufactured model, 'The Glacial'. It's a biplane which is powered by an Adverun XS v2 contra rotating propeller drive to help with constant speed. Lassi flew close, big and with controlled speed. His plane quite literally looked like it was on rails and was amazing to watch.

It would certainly take a lot to beat Lassi but Austrian pilot Gernot Bruckmann was certainly going to make him work hard. Gernot is a full time aeromodeller and seems to be a master at any discipline he turns his hand to, including jets, aerobatic gliders, indoor F3P and IMAC.

HIGH STANDARDS

The remaining preliminary rounds were a good challenge for all the competitors, with a range of weather conditions. The general standard was exceptionally high, meaning that making even minor mistakes would have a significant impact on your final position.

This Hui Yang Oreka shows an unfamiliar smoke trail in these days of electric power.

Surely one of the most recognisable faces in F3A. Christophe Paysant Le Roux with his son Antonin and his contra powered Hui Yang Oreka. Antonin, still a junior pilot, placed ninth in his first European Championships!

Third place this year from previous European Champion Sandro Matti from Switzerland.

Runner up place was taken by Austrian pilot Gernot Bruckmann with his Pavolina design. Gernot is not vertically challenged and this picture shows the huge presence of his biplane.

Top spot! European (and World) Champion Lassi Nurila with his own design and produced fully composite Glacial biplane.

I was flying my BJ Craft Epilogue powered by a Plettenberg Advance motor using a Ralph Schweizer three-blade propeller. The three-blade propeller helps give more down line braking over a two-blade propeller and I also feel the three blader really grips the air and allows me to have greater authority over my plane. This has always been a competitive setup for myself and having flown the plane for two years I felt comfortable competing with it. All four of my flights were, for my standard, very good but none were exceptional. I was hopeful to make the semi-finals.

After the four preliminary flights the top 50% of pilots progress to the semi-final. Although he had performed well, Brandon missed the cut for the semi-final by the narrowest of margin, but still with a good result and placing 32nd. Thomas and I continued to fly well, and we were pleased to progress to the semi-final rounds.

It is of note that the UK Team are regularly getting pilots through to the semi-final rounds now and it is credit to our domestic aerobatic circuit and the UK F3A Association that we are managing this. Undoubtedly success builds from pilots taking part in these grass roots competitions.

> "The purpose of these rounds is to select the top ten pilots who will progress to the final day"

SEMI FINALS

The Semi Finals days consist of the top 30 pilots in Europe battling it out over two rounds, flying the much more difficult Finals schedule. This includes many snaps, rolling circles and rolling loops, to name a few. It certainly gets your brain working in overdrive!

The purpose of these rounds is to select the top ten pilots who will progress to the final day. Again, standards were high, but more mistakes were creeping in with the more complex schedules. The scores were all very tight and there really was not a lot of difference between making the top ten and finishing 25th. Thomas flew well and placed 25th. I was very pleased to finish in 23rd.

Overall, it was a good performance from Team UK, which, along with our supporters, we celebrated with a night out, enjoying good food and some of the local Belgium beer.

FINALS

As we were not competing on the Final day we were able to enjoy watching the top ten pilots fly 'unknown' schedules which they were given the night before but were not allowed to practice. This is designed to separate the very top few such that the judges can confidently say who is the 'best of the best'.

I found that when watching the flying it became apparent that for the more difficult schedules in the semi-finals and finals that a

Finals pilots at the European Championships.

F3A European Championship 2024
F3A Inter

Sivry-Rance / Grandrieu - from 20-07-2024 to 27-07-2024

Classification

Pos	Competitors		FAI ID	Preliminary flights					Prelim /1000	Semi-final			Final			
				1	2	3	4	Total		5	6	Total	7	8	9	Total
1	NURILA Lassi	(FIN)	10600	1000.00	1000.00	~~992.45~~	1000.00	**3000.00**	1000.00	~~989.60~~	1000.00	**2000.00**	999.31	1000.00	0.00	**1999.31**
2	BRUCKMANN Gernot	(AUT)	43342	971.23	982.02	1000.00	~~956.34~~	**2953.25**	~~984.42~~	1000.00	984.85	**1984.85**	1000.00	989.25	0.00	**1989.25**
3	MATTI Sandro	(SUI)	12245	961.10	987.77	979.86	~~928.33~~	**2928.73**	~~976.24~~	980.26	976.94	**1957.20**	963.42	988.19	0.00	**1951.61**
4	ROMBAUT SEGARRA Juan	(ESP)	17485	936.03	971.15	963.24	~~935.74~~	**2870.42**	956.81	~~935.05~~	974.98	**1931.79**	958.88	973.65	0.00	**1932.53**
5	CARRIER Stéphane	(FRA)	162409	955.30	938.34	969.58	~~921.18~~	**2863.22**	954.41	~~932.01~~	981.64	**1936.05**	949.76	962.87	0.00	**1912.63**
6	CERVI Andrea	(ITA)	64877	924.79	~~902.07~~	943.87	925.74	**2794.40**	~~931.47~~	939.62	959.77	**1899.39**	930.94	960.40	0.00	**1891.34**
7	NIKLASS Christian	(GER)	142052	930.29	916.22	957.82	~~902.08~~	**2804.33**	934.78	~~921.06~~	925.13	**1859.91**	887.82	953.45	0.00	**1841.27**
8	RUBIN Marc	(SUI)	11707	903.48	913.06	951.78	~~880.48~~	**2768.32**	922.77	~~872.03~~	911.27	**1834.04**	905.79	929.09	0.00	**1834.88**
9	PAYSANT-LE ROUX Antonin	(FRA)	161958	941.35	~~939.51~~	944.45	946.02	**2831.82**	943.94	~~937.06~~	973.19	**1917.13**	901.32	921.30	0.00	**1822.62**
10	DEL VALLE VILLA Mario	(ESP)	17618	915.82	875.41	939.44	~~872.66~~	**2730.67**	910.22	~~869.67~~	929.43	**1839.65**	849.07	929.98	0.00	**1779.05**
11	VAN DER VECHT Derk	(NED)	116953	905.73	912.15	940.40	~~897.10~~	**2758.28**	919.43	~~911.06~~	912.51	**1831.94**				
12	PANZANINI Alessandro	(ITA)	66523	899.83	905.04	942.44	~~855.66~~	**2747.31**	915.77	~~906.49~~	910.40	**1826.17**				
13	SCHUMACHER Reto	(SUI)	12117	902.69	~~887.83~~	929.03	909.77	**2741.49**	913.83	~~889.08~~	908.77	**1822.60**				
14	KOHLBERGER Werner	(AUT)	50151	896.18	~~853.17~~	905.23	884.12	**2685.53**	895.18	923.42	~~892.00~~	**1818.60**				
15	SILVESTRI Sebastiano	(SMR)	79099	925.42	~~885.21~~	928.71	907.76	**2761.89**	920.63	894.77	~~894.65~~	**1815.40**				
16	MALACIOGLU Viken	(BEL)	29139	911.64	~~875.63~~	941.37	900.50	**2753.51**	917.84	~~856.24~~	891.92	**1809.76**				
17	AMATI Quentin	(FR2)	160760	866.17	870.42	916.45	~~806.49~~	**2653.04**	~~884.35~~	895.72	911.69	**1807.41**				
18	FORSTER Robert	(GER)	29855	890.94	~~861.94~~	920.22	873.29	**2684.45**	894.82	~~881.05~~	912.42	**1807.24**				
19	ORTEGA GAVILáN Luis Eduardo	(ESP)	17696	879.55	873.15	915.42	~~869.20~~	**2668.12**	889.37	~~862.25~~	917.05	**1806.42**				
20	PAWLENKO Ignace	(BEL)	90590	891.22	890.21	914.91	~~880.41~~	**2696.34**	898.78	~~875.99~~	907.43	**1806.21**				
21	ENCOGNèRE Pierre	(FRA)	78241	898.57	~~852.18~~	939.97	883.61	**2722.15**	907.38	895.40	~~874.68~~	**1802.78**				
22	SCHüRMANN Philipp	(SU2)	12021	898.00	860.21	905.49	~~855.01~~	**2663.70**	887.90	~~876.55~~	904.19	**1792.09**				
23	BALFOUR Malcolm	(GBR)	162425	872.75	~~869.61~~	906.30	889.79	**2668.84**	889.61	~~878.82~~	895.26	**1784.87**				
24	BEN AMI Omer	(ISR)	84906	883.09	914.99	915.60	~~868.08~~	**2713.68**	904.56	~~860.20~~	874.52	**1779.08**				
25	DAVID Thomas	(GBR)	135030	~~845.09~~	867.12	907.88	878.53	**2653.53**	884.51	893.23	~~839.01~~	**1777.74**				
26	VAN VLIET Danny	(NED)	362850	902.82	~~829.04~~	928.73	861.31	**2692.86**	897.62	~~830.42~~	861.75	**1759.37**				
27	VOTAVA Jan	(CZE)	17144	875.68	~~869.35~~	892.12	870.27	**2638.07**	879.36	~~863.55~~	879.79	**1759.15**				
28	VAVALA Francesco	(ITA)	20100	897.61	~~860.01~~	900.41	866.99	**2665.01**	888.34	868.71	~~839.73~~	**1757.05**				
29	CANTU Alberto	(GER)	75541	888.74	~~846.52~~	873.29	879.59	**2641.62**	880.54	873.17	~~866.78~~	**1753.71**				
30	BELLERT Dominik	(GE2)	19743	870.71	~~852.33~~	862.37	897.43	**2630.51**	876.84	~~794.86~~	842.43	**1719.27**				
31	PARADELA GARALOCES Christian	(ES2)	17654	854.74	~~826.95~~	886.12	886.24	**2627.10**								
32	RANSLEY Brandon	(GBR)	173760	884.46	884.31	~~844.05~~	852.31	**2621.08**								
33	KAUKORANTA Kimmo	(FIN)	10538	867.73	~~820.93~~	894.11	858.21	**2620.05**								
34	KRAL Jan	(CZE)	54429	850.54	867.10	890.19	~~786.07~~	**2607.83**								

Score sheet for the top 34 pilots.

biplane is advantageous. The reason I say this is that they seem to be so comfortable in the knife edge attitude that the pilot's workload seems to be reduced, whereas some of the monoplanes required more work to encourage them round the knife edge or rolling loop segments. Perhaps food for thought for my next F3A plane?

Some pilots of note were Stephane Carrier, who was the top French pilot, finishing in fifth flying his own design biplane, 'The Velar'. This presents very well, appears locked in and seems to fly the schedules with ease.

Sandro Matti from Switzerland, flying his Advantage Biplane powered by a Plettenberg motor with a three-blade propeller, was outstanding and he finished third. Sandro must surely be the King of Stall Turns; he can literally make the plane hover before rotating 180 degrees with complete control. It's a deceptively difficult manoeuvre which Sandro takes to another level.

Gernot Bruckmann and Lassi Nurilla were battling it out to be top dog and they both flew superbly in the Finals. They have two very different styles, with Gernot flying much slower but still with complete authority and Lassi with a much faster but still controlled style. All pilots in the top ten achieved so much but in the end Lassi retained his title by a small margin, with Gernot taking the runner up position.

All the finalists are great pilots and the motto of the event held true: *'Competitors in the sky, friends on the ground'*.

The prize giving took place shortly after, followed by the closing banquet in one of the large marquees, where we all enjoyed fantastic food and company.

HOMEWARD BOUND

The journey home gave me time to reflect on an amazing adventure with my teammates and fellow competitors. I enjoyed it all.

I would like to compete in future events and keep pushing higher up the rankings, if possible. Indeed, I might have to try my hand flying a biplane! ■

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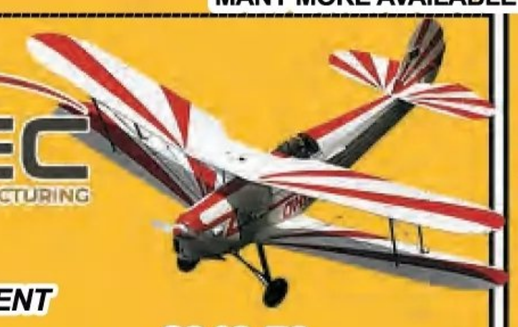

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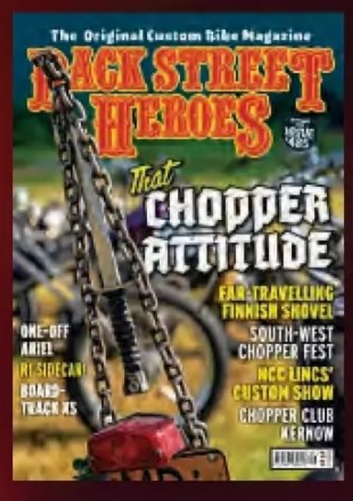

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COUGAR 2000

Ian Peters builds the kit-built version of a versatile fun-fly model from Weston UK

Words **Ian Peters**

Photos **Ian Peters, James Bradley**

One day I was browsing the balsa section in Weston UK when Alan approached me and asked if I would like to write an article about their new kit of the Cougar, building it from plans to covering. Two weeks later I was given a box of laser cut parts, sheet and strip balsa, glue, covering and accessories, along with servos, ESC, motor and LiPo battery. I had everything required to build and finish the model, except for the full set of plans/drawings and only an A4 sheet showing details of the tailplane, elevator and rudder.

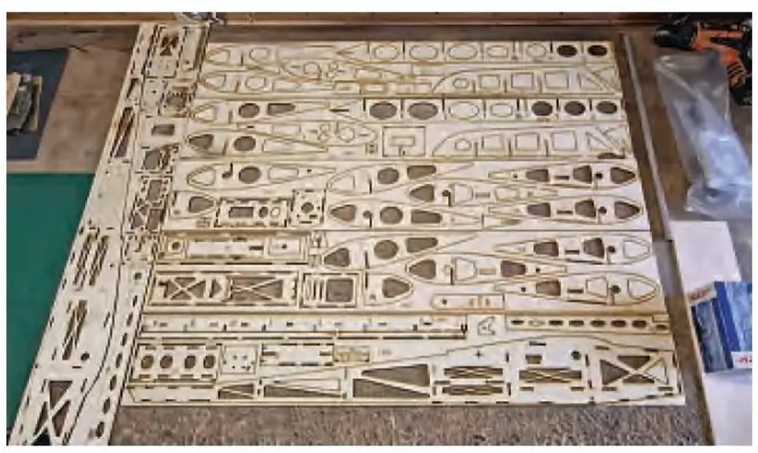
While scanning all the laser cut balsa and ply sheets, I noticed that the parts numbered 65, 69, 55 and so on were numbered by the length of that part e.g. part 55 is 55 mm long. This is a great help in identifying these parts which are for the rudder, tailplane, elevator and ailerons.

This article might sound like a building guide, but it is how I built the Cougar. When you get the kit, you will obviously have the plans and instructions.

So, on with the build...

TAILPLANE

Start the tailplane by pinning down the front part, TAF, making sure it is straight. Pin and glue the centre piece, TAC in place. Offer up the rear part, TAR, and both tips. Once aligned, pin and glue the tips in place.



Kit contains a wealth of laser cut kit parts.

Ian lines the Cougar up for a slow pass.

Next, glue the rear part to the centre piece and the tips, making sure it is straight. Then add the four ribs (Part 55) followed by the six 3 mm cross braces.

ELEVATOR

Pin in place the elevator leading edge, ELF, using a ruler to keep it straight. Insert six ribs (using more 55s) and then push the trailing edge, ELR, onto the ribs, pinning it down after checking the ends are square. Cut to length and insert six 3 mm diagonal cross-braces, then glue using thin CA to wick into the joints

The tailplane slots together very quickly.

FIN POST

Glue the Mylar hinges in place in one half of the fin post, making sure the hinges are attached to the rear of the post (there is a notch cut out at the bottom). Note that the fin post will be inserted into the fuselage and the tailplane, so the lower hinge needs to be above the tailplane.

Attach the other fin post, joining them both together by sandwiching the Mylar hinges in-between, using a straight edge to keep them straight and level.

RUDDER

Pin and glue parts RF and 75 in place, keeping both square. Offer up RR and 65 and when square pin in place. Add part 95 and the two diagonal 6 x 3 mm cross-braces. Glue all in place.

The elevator is built in a similar fashion.

FUSELAGE

Start by laminating the wing fixing block and inserting the claw nut.

Lay flat one fuselage side and dry assemble all parts onto this from F4 forward (formers, battery tray, wing fixing block, hatch frame, etc.) F1 will be glued in place after the opposite side is attached. When everything is in position tack glue all components to the first fuselage side.

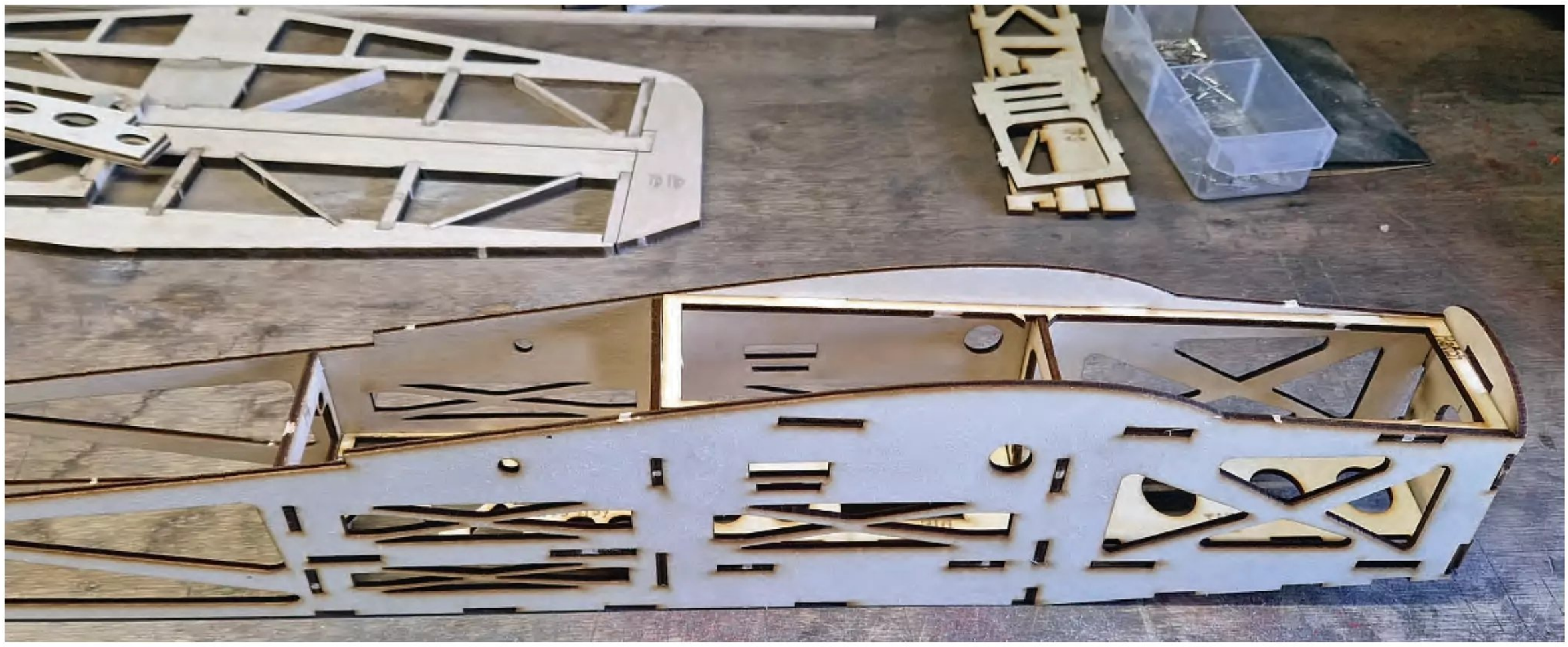
Now offer up the opposite fuselage side, then place the bottom of the fuselage on the bench and check everything is square, then tack glue the second fuselage side to the fuselage formers. Fit F1 and wick medium CA into all joints.

Place the fuselage upside down on the bench. Fit claw nuts and the doubler to the floor for mounting the undercarriage, then glue both floors in place onto the lower fuselage. Insert formers F5 and F6, then lay

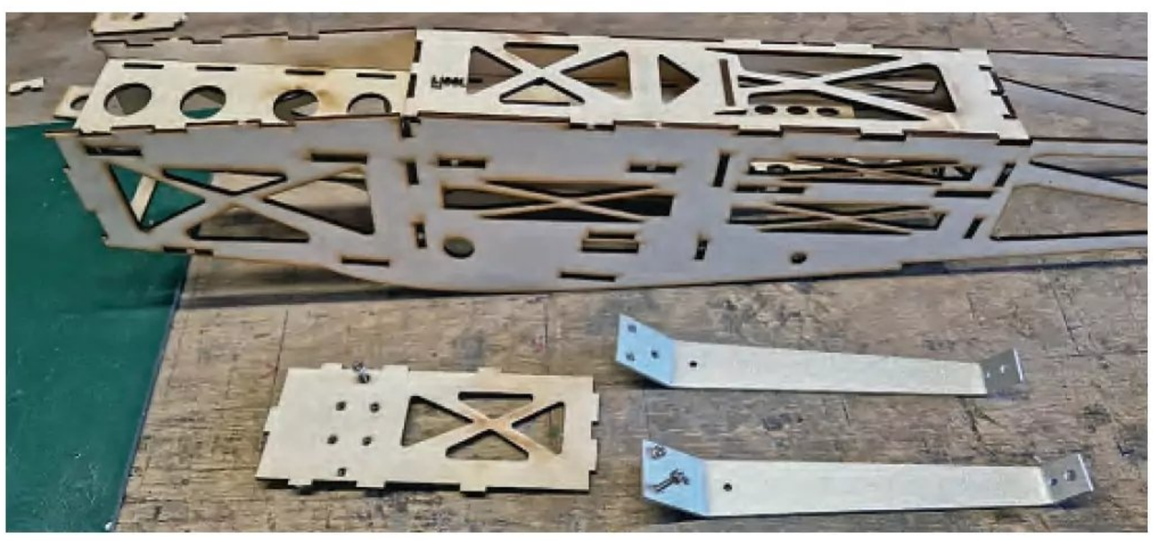
Finished fin and rudder ready for sanding.

Initial stage of fuselage construction.

Mylar hinges are sandwiched between the two fin post halves.



Upright after adding the second side.



Undercarriage legs are bolted to sturdy ply mounting plates.

A sharpened ali tube was used to ream out holes for the rudder closed loop guides.

Lining up the tailplane and fin on the rear fuselage.

Rear decking in place after planing and sanding it to follow the fuselage sides. Just needs rounding off.

Stringers are used to fill in the underside of the fuselage.

the fuselage flat, bottom side down. Glue in place TPB, making sure the sides are vertical, then glue in place TPS.

Offer up the tailplane and fin post. Mark the leading edge of the tailplane to determine where the rear fuselage top sheeting will end. Glue in place a fillet either side of TPS.

Mark two parallel lines, 3 mm apart, the length of the fuselage (I marked along my bench, but you could use paper). Mark the position of former F1 on the lines and the positions of formers F4, F5, F6 and F7. Pin a strip of 3 mm sq. balsa between the two parallel lines at positions F4, F5 and F6, then place the fuselage over the balsa strip to keep everything aligned. Glue in formers F5 and F6 after sliding plastic under their outer edges to stop the fuselage from being glued to the bench.

Now everything is aligned cut the 6 mm rear upper balsa sheet to length and glue it in place on the rear upper fuselage. Trim and sand to match the fuselage sides.

Cut out a slot in the top sheet to take the fin post and offer up the tailplane, fin and rudder to check that everything fits as it should. Leave the fin and tailplane in place and insert an M6 bolt into the wing retainer.

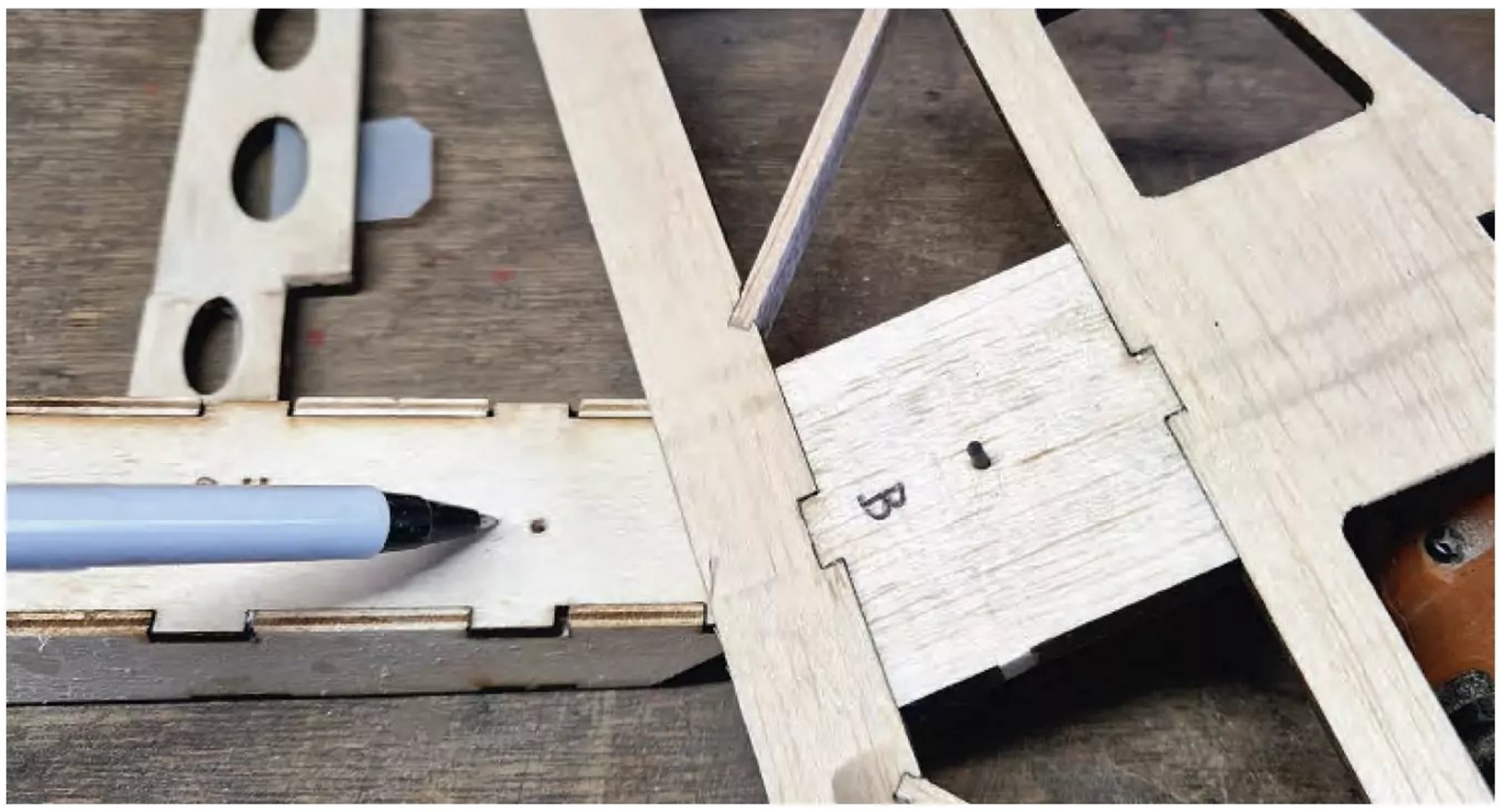
Measure from the bolt to either side of the tailplane to check for square.

Drill a hole in the rear centre of the tailplane (I used a 2 mm carbon rod to make the hole). Remove the tailplane and glue the pin into the lower side of the tailplane. This will save you from having to keep checking for alignment through the rest of the build.

Cut holes for the rudder cable guides. I used a piece of aluminium tube, approximately 3 mm in diameter, sharpened on the inside to create a cutting edge.

Now the stringers (6 x 3 mm) can be cut to length and glued in place on the underside of the rear fuselage.

Drilling a hole for the tailplane location pin.



The locating pin fits in the hole indicated to save you from having to keep checking the tailplane alignment through the rest of the build.

Use a weighted bar to hold the wing structure straight while the glue sets. A spirit level and club hammer do a good job here.

WINGS

Remove the parts from the laser cut sheets and sand them.

Construct the wing jig, then, using the two parallel lines previously drawn 3 mm apart on the bench or on paper, draw a line at 90° to these lines where the root rib A will go. Pin the balsa blocks either side of the main spar. Place all the ribs on the spar and slide the wing jig under the ribs, lining it up with the marks provided on the ribs and pin in place. Attach the leading edge and rear spar. After checking root rib A is square place a bar along the span of the wing and weigh it down. Now glue all the components.

Next, glue in place the servo tray and the doubler on the inside. Cut to length and glue in place the upper 1.5 mm balsa sheet from the main spar to the leading edge. Make sure the leading edge has been sanded to the contour of the rib before sheeting.

Cut the capping strips to length and glue in place to the top and bottom of the ribs. Insert the wing tip supports 'dry', then offer them up to the end of the wing and glue in place. Glue on the 1.5 mm capping strips along the trailing edge of the wing. Cut to length the inboard sheeting from 1.5 mm forward sheeting off-cuts.

Tape plastic to the fuselage sides. Insert the wing joiners and rear peg in the wings, then push both wings in place on the fuselage. Once in place clamp the root rib A to the fuselage sides. Screw the wing retaining bolt through the wing retaining plates and glue the wing retaining plates to ribs A and B. Do the same with the rear pegs.

Turn the model upside down then glue in place the inboard sheeting to rib A and the two ribs B. Do the same with the top inboard sheeting once the clamps have been removed

AILERONS

Pin down Ail F then offer up parts 55 and 82 to Ail F. Keep parts 55 square to Ail F and offer up Ail R. Pin this in place, then glue in place parts 55 to 82.

Add cross bracing then remove from the board and sand, ready for covering.

FINISHING OFF

The entire model can now be now sanded and covered. The next step is to hinge and glue the elevator, tailplane, fin and rudder. Once completed, the tailplane is glued to the fuselage (making sure it is level), then the fin and rudder are glued in place. Next, install the undercarriage and motor. Then the elevator push rod and rudder cables are installed. After fitting control horns to the elevator and rudder the tailskid is glued in place, along with the cooling scoops just aft of F1. Hinge and glue the ailerons in place, then install the servos, horns and pushrods.

SUMMARY

The Cougar goes together extremely well.

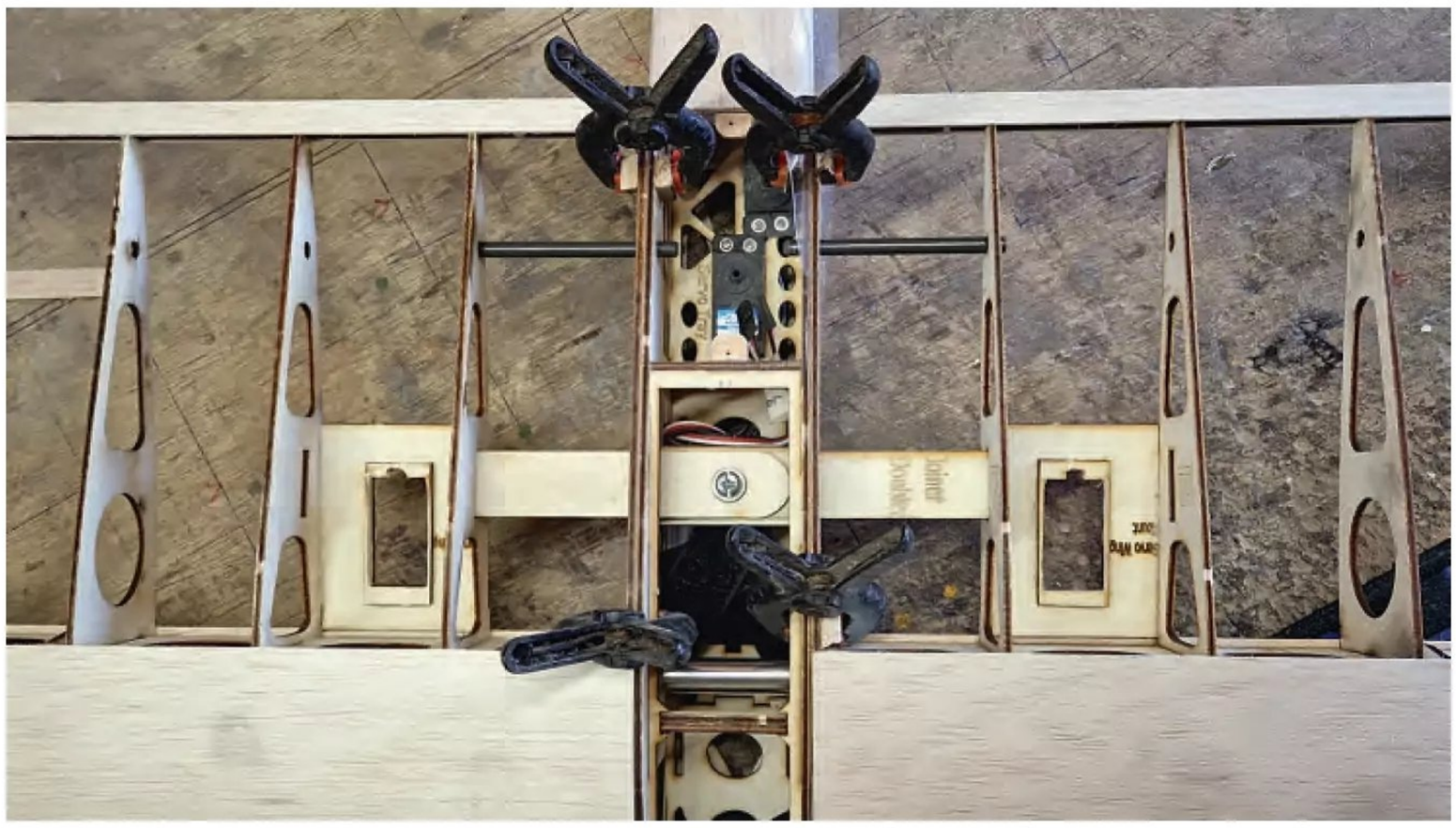
I was provided with a drawing for the tail surfaces only as the plans and instructions were still to be drawn up. Despite this I was able to locate and assemble all parts with ease due to the lock-together assembly of the fuselage, main wings and all parts being numbered with the part location numbers on the main spars, tail surfaces and ailerons.

I used Weston UK superglue throughout the whole build (all bottles come with a pin in the lid to keep the nozzle clear), using thin CA on balsa-to-balsa, medium CA on all ply parts and thick CA on balsa sheeting, such as wing sheeting, capping strips and the rear upper balsa sheet on the rear fuselage.

Cooling air for the ESC and battery comes in through the two air scoops on either side of the fuselage behind former F1 and exits through a hole in the lower fuselage below the wing joining plates.

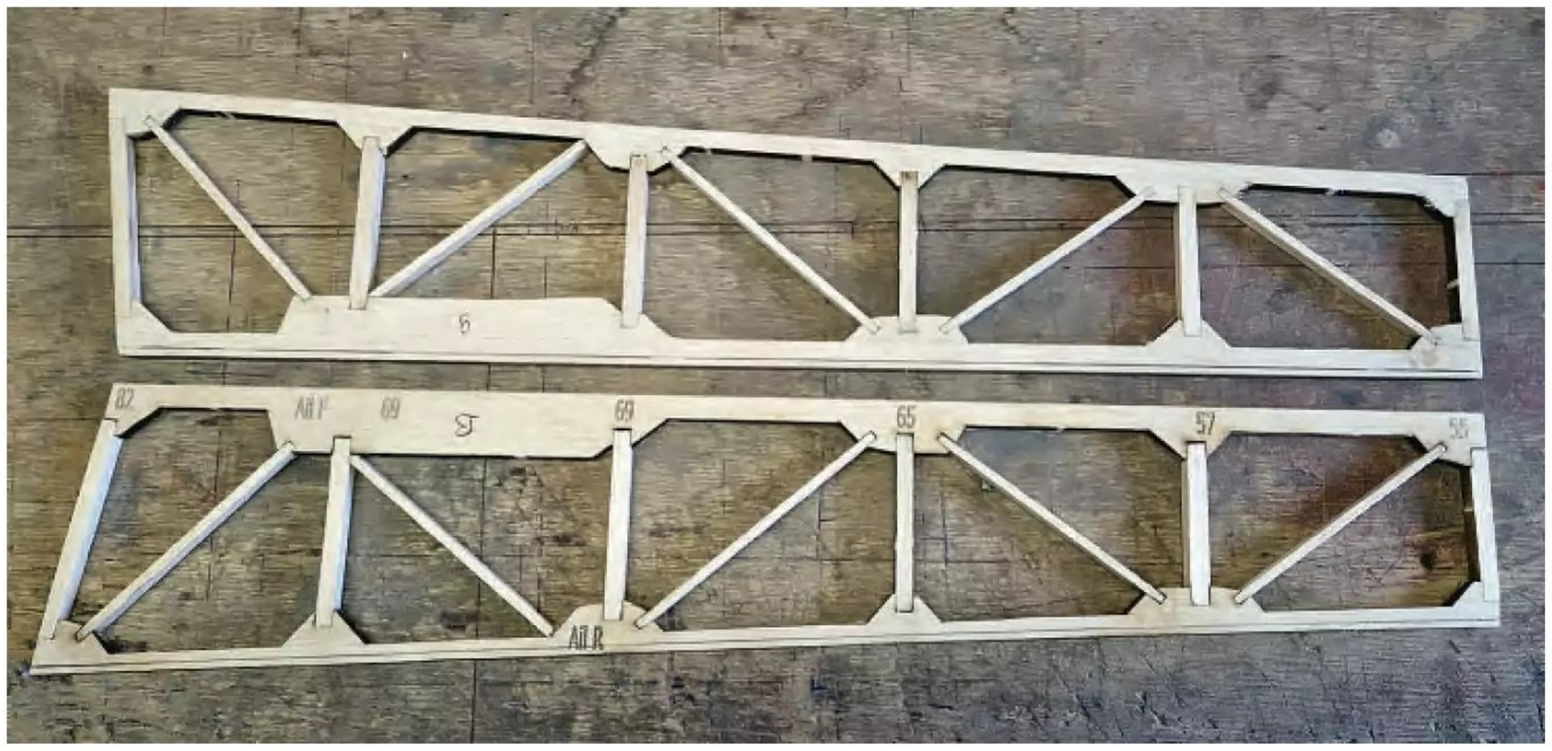
The only thing I changed was the diameter of the wheels from 55 mm to 70 mm as the only time my flying patch gets mown is when the sheep pass by.

Starting to add the wing sheeting. Note the wing jig supporting the structure at the rear.



Trial fit of the wing panels to the fuselage.

Ply wingtips push into slots in the ends of the main spars.



Well braced ailerons use plenty of gussets.

Brightly covered and ready for the flying field.

The kit-built Cougar can see you through from early training flights with reduced controls to full blown 3D manoeuvres with 'barn door' throws.

The layout of the fuselage makes for easy installation of the receiver servos, ESC and battery despite it being a narrow body. To aid removal of the 4S LiPo, I glued a strip of Velcro (loop side) to the inside top of the fuselage, on one side.

This is an easy to build machine and it only took me three weeks from start to finish. Once built the model is easily converted to I/C or I/C to electric. The entire model was covered with Ripmax AEROFILM which went on easily and has good shrinkage properties. JX servos were provided by Probuild UK. The model, having a two-piece wing (joined by an aluminium tube and one nylon wing bolt) packs away nicely into the car and workshop.

FLYING

I loaded the Cougar into the car and set off for the field. I assembled the model in two

Weston UK cyano was used throughout the build.

minutes, performed a range check and checked all control surfaces for correct deflection.

There was a strong wind and the sheep had not 'mown' the grass to my liking, so I had to hand launch the model. I opened the power and launched the model into the air. It left my hand straight and true.

Once up, I flew a couple of circuits with no trim required. I performed various manoeuvres (loops, rolls, stall turns, prop hanging and knife-edge) and found the model to be very response yet smooth, with no nasty tendencies, even in the strong wind. The landings were a breeze - no pun intended!

I flew the Cougar until I hit the low voltage cut-off. That's something that I don't usually like to do but I was having so much fun! Despite the thick wing the model still penetrated the wind, using a little down elevator to keep a little speed on during the descent. The model flared out and touched down at almost zero airspeed with no sign of a tip stall.

I can see why this model would be a good choice for learning to fly on. ■

DATAFILE

Model:	Cougar
Model type:	Fun fly, 3D and trainer
Manufacturer:	Weston UK https://www.westonuk.co.uk
Length:	1060 mm (front of spinner to rear of elevator)
Wingspan:	1250 mm (49.2")
Flying weight:	1.9 kg (4.2 lb)
Aileron servos:	2 x JX PS-4806 HB-2 (6.21kg/cm)
Rudder servo:	JX PDI-HV610MG (9.35kg/cm)
Elevator servo:	JX PDI-HV610MG (9.35kg/cm)
Motor:	Multiplex Roxxy 4250/06 880kV 850W 58A
ESC:	ZTW Beatles 80A SBEC 8A 5/6V
LiPo:	Radient Superpax 4S 14.8V 3250 mAh 50C
Prop:	APC 11 x 8 (40.38A, 593W, 8-minute flying time) APC 11 x 10 (46.49A 691W, flying time TBC)

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Going Places

Diary dates for the coming season

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

OCTOBER

Oct 12

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

Oct 12

Delyn Model Flying Club Swapmeet at Halkyn Parish Hall and library, CH8 8ES. what 3 words: shrub.poems.continued, off A55 junction 32b. Open for sellers from 9:00am and buyers 10:00am. Tables for sellers £3 including entry and buyers entry £1. Tea and coffee available and unlimited parking. For booking tables ring Bill Lowes on 07811 159891 or darcyrabbit@aol.com.

Oct 19 - 20

PSSA Fly for Fun event at The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for pilots brief 10am each day. Proof of BMFA (or equivalent) insurance and Pilot Competency certificate required. All models to be fitted with compliant CAA OpID number. For more information contact Phil Cooke on 07772 224719 email webmaster@pssaonline.co.uk or go to www.pssaonline.co.uk/about-us/events/

Oct 22

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

Oct 27

Leafields MAC Autumn Swapmeet at Pinxton Miners Welfare, Wharf Road, Pinxton, Derbyshire, NG16 6NY. Doors will be open to the public at 10:00 am and traders are welcome from 08:45 am onwards. Admission is £2 pp at the door for adults with under 15s free entrance. Hot and cold refreshments will be available throughout the course of the morning. Tables are available at £5.00 each and are selling very well so if you wish to wish to book a table, please ring Dave Moore on 07793 815654 or email at gyrservices@w3z.co.uk.

Oct 27

King's Lynn Aero Model Club Swapmeet at West Winch Village Hall, Watering Lane, West Winch, King's Lynn. PE33 0JY. From 9:00 am to 11:30am. A great event to buy, sell and collect all types of flying models, kits, engines, radio control equipment, spare parts and all associated paraphernalia. Vintage to present day and beyond! Tables are £5 each - booked and confirmed in advance. £8 on the day if available. This includes admission of one Stall Holder. Entry for Stall Holders is from 8.00am. to 8.45am. Public from 9.00am. Light Refreshments, teas & coffee will be available. Contact Mick on 01406 351016 or Gerry on 01945 582023 or email: klamc.2009@btinternet.com

NOVEMBER

Nov 2 - 3

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

Nov 3

Retford Winter Swapmeet at Carlton-in-Lindrick Civic Centre, Oakham Drive, Carlton-in-Lindrick, Worsop, Notts, S81 9RE (what3words: blog.otherwise.nurse). Table setup from 8:30am till 9:15am, tables supplied. Pre-booked tables £7. On the day £8. Admission £3. Doors open 9:30 till 11:45am. Hot sandwiches, tea, coffee available. For further information and bookings contact Lee Davies on 07900 156803 or email lee.davies5@btinternet.com or visit www.rmfc.bmfa.uk

Nov 9

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

Nov 17

Horam Swap Meeting at Horam Village Hall, A267, Horam, East Sussex TN21 0JE. Doors open to sellers 8.00am. Tables and one seller £8. Buyers' entry from 9.00am and £3. Refreshment including our famous Bacon Butties. For bookings (essential) contact Robert Richardson at rob.richardson@talktalk.net. What3Words: self.planting.brave.

Nov 24

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

DECEMBER

Dec 7 - 8

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

2025

JANUARY

Jan 11

Tonbridge Gassers and Rubber Fanciers
Indoor Flying at Kings Sport Centre, 601 Maidstone Road, Rochester, ME1 3QJ. From 6:30pm until 10:00pm. 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.

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Steve Ott

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AIRSALE AUSTER AOP9 airframe - £100. Isaacs Fury from Flying Scale with OS40, both unused - £100. Bernard French Fighter prototype with OS engine, unflown - £200. ASP70 four stroke engine - £100. Call Geoff on 01483 283268 (Surrey).

SPITFIRE 65" wingspan, motor, speed controller, all servos and retracts - £100. 07964441912 (Worcs).

TWISTER HELICOPTER complete with 35 MHz, all servos, spares, two sets of blades, tail boom, main drive gear. Offers? Buyer to collect. Money will go towards the Museum of Berkshire Aviation (Berks).

CLARKE 300 mm variable speed lathe in excellent condition. Extras, 4-jaw chuck, dial gauge, parting off tool attachment, die holder, rotating centre, cutting tools, centre drills, wood turning fence, three chisels, aluminium stock - £600 ono, buyer to collect. 07960 120730 (Leics).

SHORT KITS of vintage Graupner Cirrus with fibreglass fuselage and new Selig 3021 thinner wing profile or original fuselage copies (fibreglass) available too. (No original wing kit) – offers? Email: airxav@hotmail.com (Geneva).

1/4 SCALE BALSA USA NIEUPORT 17c, new kit with guns & wheels - £410. Tiger Moth 1/4 scale, Grasshopper Cub, Tony Ray Minimoa, Gloster Gladiator (Sarik) airframes. Ready to fly – offers? Call Richard for more details on 07926 870748 (Derbyshire).

FOKKE RC SPITFIRE Mk14E, 1/5 scale kit, includes laser cut wood, plans, canopy, cowling, spinner wheels, electron, electric wheels with legs, DLE 61 petrol engine with electric ignition - £800. Buyer to collect. 01763 663016 (Herts).

DURAFLY VAMPIRE or Alfamodel Beaufighter - £30 each. Call Laurence on 07485 134314 (N. London).

FUTABA CHALLENGER transmitter FP-T6 NFK. PCM receivers FP-R139 6P x 2. Dual conversion receivers FP-R128 DF x 2. FP-R129 DP, FP-R138 DP. Jeti 8-channel receiver, REX 8JBC (unused). 2 boxes of 35 MHz crystals (32 total) – offers? 07516 303253 (West Sussex).

TOP FLITE P-47D Thunderbolt 63" span ARF, unflown. Laser 80 was installed and removed for another model. Fit your Laser 80 and receiver to fly - £235. 01506 822066 (Bo'Ness).

JERRY BATES 1/4 SCALE SEA FURY plans, laser cut wood kit and canopy. Wingspan 115" - £300. Buyer to collect. 01763 663016 (Herts).

CENTURY UK MAX THRUST RTF, red, 1350 mm, aircraft grade alloy undercarriage. Tough epoxy construction with MC6A 6-channel 2.4 transmitter and receiver. Two Overlander 2200 mAH 3S LiPos, GT power SD4 balance charger. Bright wing tip LEDs and two props. Only had four flights. Big saving on new price - £235. 01506 822066 (Bo'Ness).

BBMF DYNAM SPITFIRE 1200 mm wingspan - £210. Lancaster Bomber V3 1320 mm wingspan - £210. Hawker Hurricane 4-cell, 1200 mm wingspan - £210. BBMF Three - £600. Lancaster is new but the Spitfire and Hurricane are used but in good condition. Call Eric on 07899 281915 (Somerset).

WANTED

1/3 SCALE CIVILIAN PILOT for large SLEC Turbulent balsa model aircraft. 01905 345537 (Worcs).

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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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GR7 HARRIER

For those of you who have seen Tony Nijhuis' exploits over the last few years when trying to get a model Harrier jump jet to successfully VTOL, you may be a little disappointed that his latest Pro-Plan jet offering doesn't have any VTOL features. But don't let that put you off building one as Tony reckons it is an absolute peach of a model to fly and performs faultlessly. Tony's VTOL version took 13 attempts to get to hover and fly successfully and the all-important flying characteristics of that thirteenth Harrier have been used to develop this latest hand launch EDF jet.

BUTCHER BIRD

The Focke-Wulf Fw 190, when introduced by the Luftwaffe in WW2, caused quite a shock to the Allies. It had a top speed of over 400mph and being heavily armed it was a formidable foe. The wide spaced undercarriage made ground handling and landings less fraught than the Me 109 and it was well liked by its pilots. These latter characteristics also make the 190 a good warbird subject and ones that Dave Keen had admired for many years. Dave is a keen scale modeller so when his family were looking for a suitable big birthday present, and knowing Dave's love of building, they bought him the Vailly Aviation plan, cut parts, cowl and canopy for the 28% scale Fw 190 for 150cc plus engines, leaving Dave to source the remaining items. Join Dave's clubmate Frank Skilbeck for a Model Magic feature on this impressive scale aeroplane

MARVELLOUS MODELAIR

There's something undefinable about Old Warden airfield and The Shuttleworth Collection and like so many others Dave Goodenough wishes he could put his finger on it. Driving in through the 'new' entrance and the long access road lifts the spirits, increases the heart rate and the day seems that much brighter. Arriving on a fine late July day and parking close by the R/C runway entrance, Dave stumbled around the sea of cars disgorging many objects of aerial beauty. So, what did he see, who did he trip over and what modelling delights blessed his camera? Tune in next time to find out.

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PARTING SHOT

MAKING A SPLASH

After making a fast pass down his local lake, the Editor turned and lined up this XFly-Model Twin Otter for take-off. Just after powering up the powerful twin brushless motors the floats hit the wake created from the previous pass and all hell broke loose! When the spray had settled, no harm was done and the model went on to make a successful flight.

The moral of this story is to slow down when cruising on the water and stop creating waves!

DATAFILE

Photo by:	Frank Skilbeck
Camera:	Canon EOS 40D
Lens:	Canon EF-S 55-250mm f/4-5.6 IS
Aperture:	f/32
Shutter speed:	1/250 sec
ISO:	400
Focal length:	179 mm
Exposure:	Shutter priority, Spot metering

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SPEED @ 8.4V

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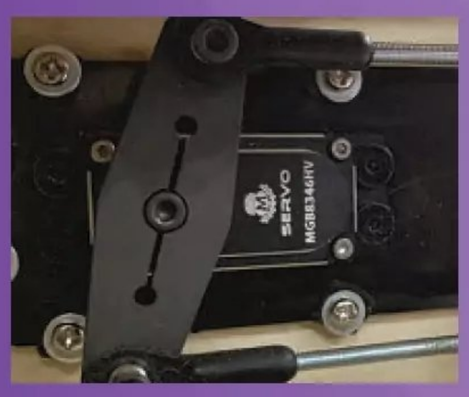

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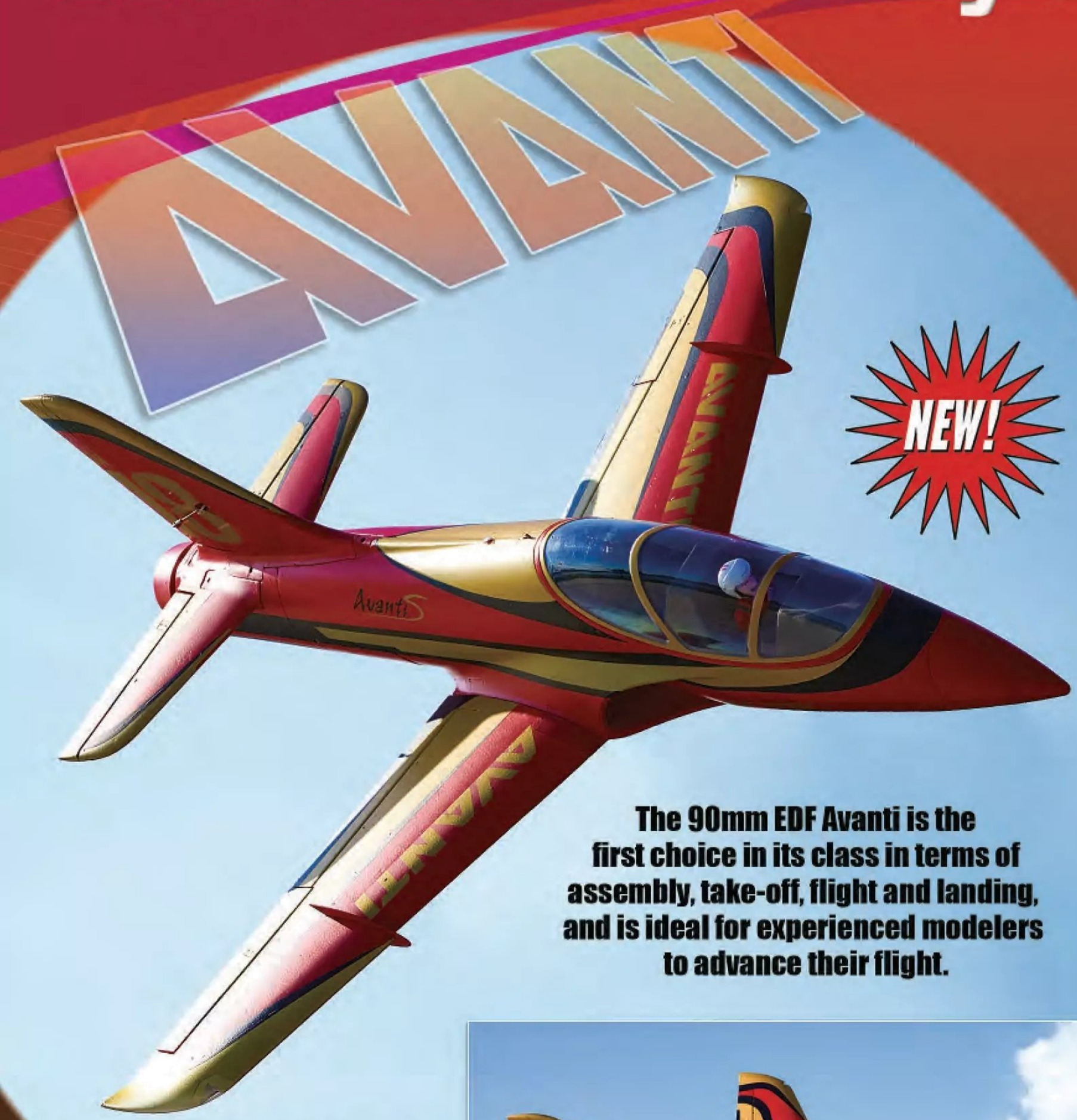

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SPEC CHECK:

- Motor size: 3670 KV1950 in-runner
- Wingspan: 1290mm /50.8 in
- Length: 1360mm /53.5 in
- Assembly Time: 10 minutes
- Experience Level: Intermediate/advanced
- Wing Load: 100 g/dm² (0.19oz/in²)
- Wing Area: 32dm² (495.8 sq.in)
- Flying Weight: Around 3200g
- Propeller/Fan: 90 12-blade
- Speed Control: 120A
- Servos: 13g × 8

Please Note: This is sold in ARTF format and requires 6 Channel Radio System, 22.2V, 5000mAh-6000mAh 45c Li-Po Battery, Charger and AA batteries.

AVANTI 90MM EDF AVANTI 18TH ANNIVERSARY EDITION

- Electronic Configuration: High-quality 120A ESC, high-power in-runner 3670 KV1950 motor, high-efficiency 90mm 12-blade ducted fan unit, high-precision metal digital servos.
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LINE INDICATES
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DIAGONAL FISHING LINE
BRACE TO VERTICAL STAB
UPPER CORNER

1/4" BASSWOOD
BLOCKING (TYPICAL)

TYPICAL STABILIZER RIBS
1/16" x 7/16" BALSA

5/16" x 3/8" ST
SAND TO PI

5/16" x 3/
(NOT

CONTROL HORN
PLATE

TYPICAL ELEVATO
1/16" x 1/4" BA

1/4" BASSWOOD
BLOCKING

5/16" x 3/8" TAPERED
BALSA ELEVATOR EDGES

Ø3mm BENT WIRE
ELEVATOR CONNECTOR

3/16
TAPERED

300

1/2" WIDE
EXTRUDED
ALI. AEROFOIL
STRUT

INSERT
HEATSHRINK
TUBE HOLE LINER

USE TIN SNIPS

20

16

LSA L.E.
L SHAPE

5/16" x 7/16" BALSA TIPS
SAND TO PROFILE

TYPICAL ALL CORNERS:
1/4" FILLET GUSSETS

TRIP BALSA
ROFILE

8" STRIP BALSA
E BEVELS)

OR RIBS
ALSA

x 1 1/8"
BALSA T.E.

5/16" x 7/16"
TAPERED BALSA

BATTERIE
MOTORS:
ESC'S: TW
WING LO
WEIGHT:
WINGSPA
PROPS: TW
RX: 4 CHA
WING AR

SHAPE L.E. TO MATCH
WING END ANGLE

3/32" BALSA SHEET
ANGLED WING TIP

SHAPE AILERON END & T.E. TO
MATCH WING END ANGLE

16 12

BATTERIES: TWO 2200mAh 3S Li-Po
MOTORS: TWO E-FLITE PARK 480 250W 950kVA
ESC'S: TWO 30A
WING LOADING: 21oz/ft²
WEIGHT: 6lbs 10oz (INC. 6oz LEAD NOSE WEIGHT)
WINGSPAN: 72" (1:12 SCALE)
PROPS: TWO APC 11-6 FOUR BLADE (COUNTER-ROTATING)
RX: 4 CHANNEL (RUDDER, THROTTLE, ELEVATOR, AILERONS)
WING AREA: 5ft²

APE L.E. TO MATCH
WING END ANGLE

TYPE 1

3/32" BALSA SHEET
ANGLED WING TIP

1/8" LITE PLY RIB

INSTALL 1/4"
BASSWOOD BLOCKS
TO TOP OF RIB PROFILE

TYP. ALL RIB
3/32" BALSA U
NOTED OTHE

TYPE 1

CA HINGES (TYP)

SHAPE AILERON END & T.E. TO
MATCH WING END ANGLE

THREAD BENT WIRE THROUGH
AILERON & MAKE TWIST CONNECTION
ON UPPER SIDE TO Ø1.5mm ALI TUBE
UPPER AILERON DRIVER ROD

Ø2mm ALI
TUBE

BOULTON PAUL P-75 OVERSTRAND

BY JON HARPER

PLAN No: RC2266	No. OF SHEETS: 3 OF 4	First published in RCM&E September 2024

SCALE INCHES

8 4

TYPE 1

TYP. EXTRUDED ALI STRUT WITH END BENT OVER & SCREW HOLE. FASTEN INTO 1/4" BASSWOOD BLOCKING

S ARE
UNLESS
RWISE

HIGH TORQUE
MINI SLIM SERVO

1/8" LITE PLY RIB

BUILT UP CONTINUOUS REAR SPARS 1/16" x 1/8" TOP & BOTTOM WITH 1/16" SHEET WEBS BETWEEN ALL RIBS

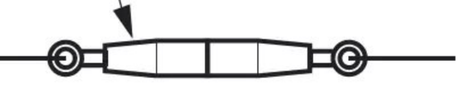
TYPE 1

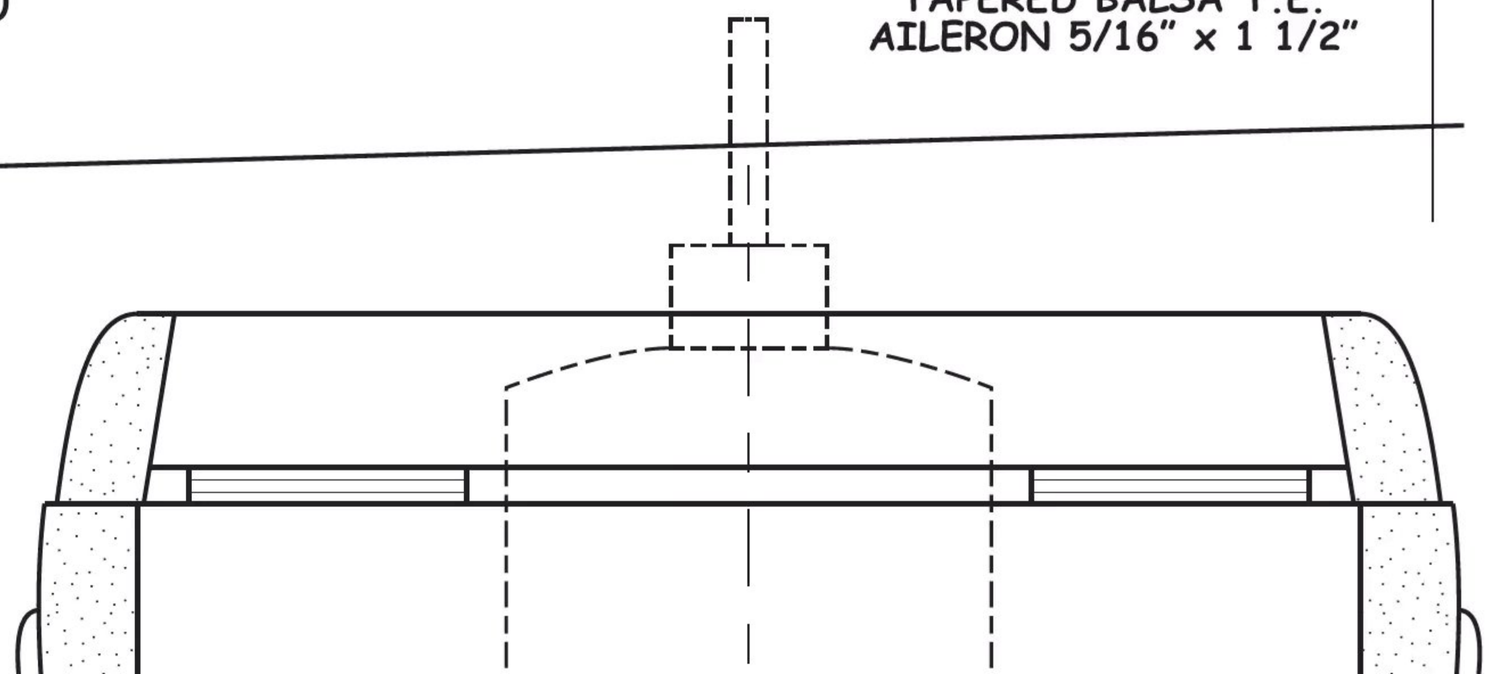
3/8" x 3/8" BALSA T.E.

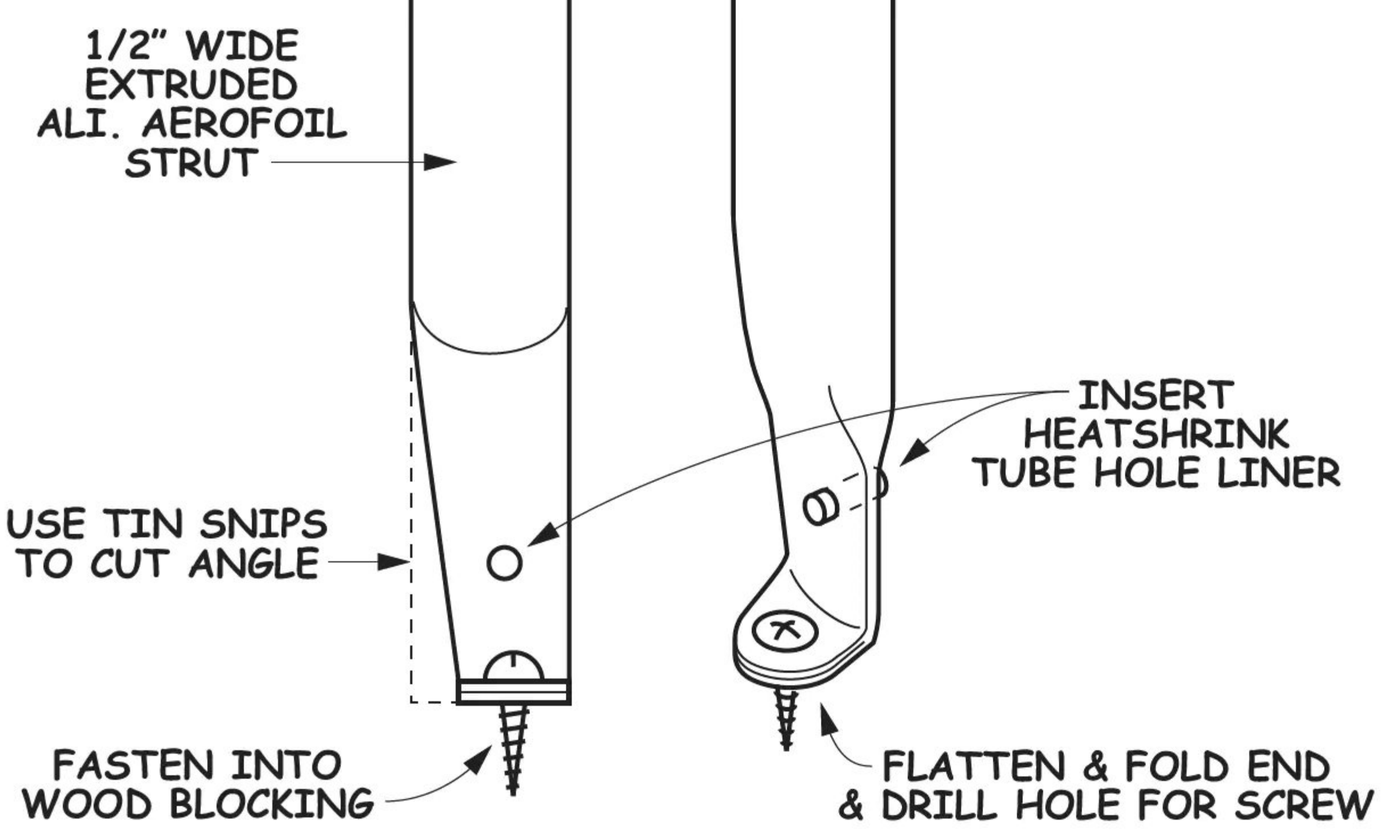
CONTROL HORN CUT FROM SPARE SERVO ARMS (ON UNDERSIDE)

TAPERED BALSA T.E. AILERON 5/16" x 1 1/2"

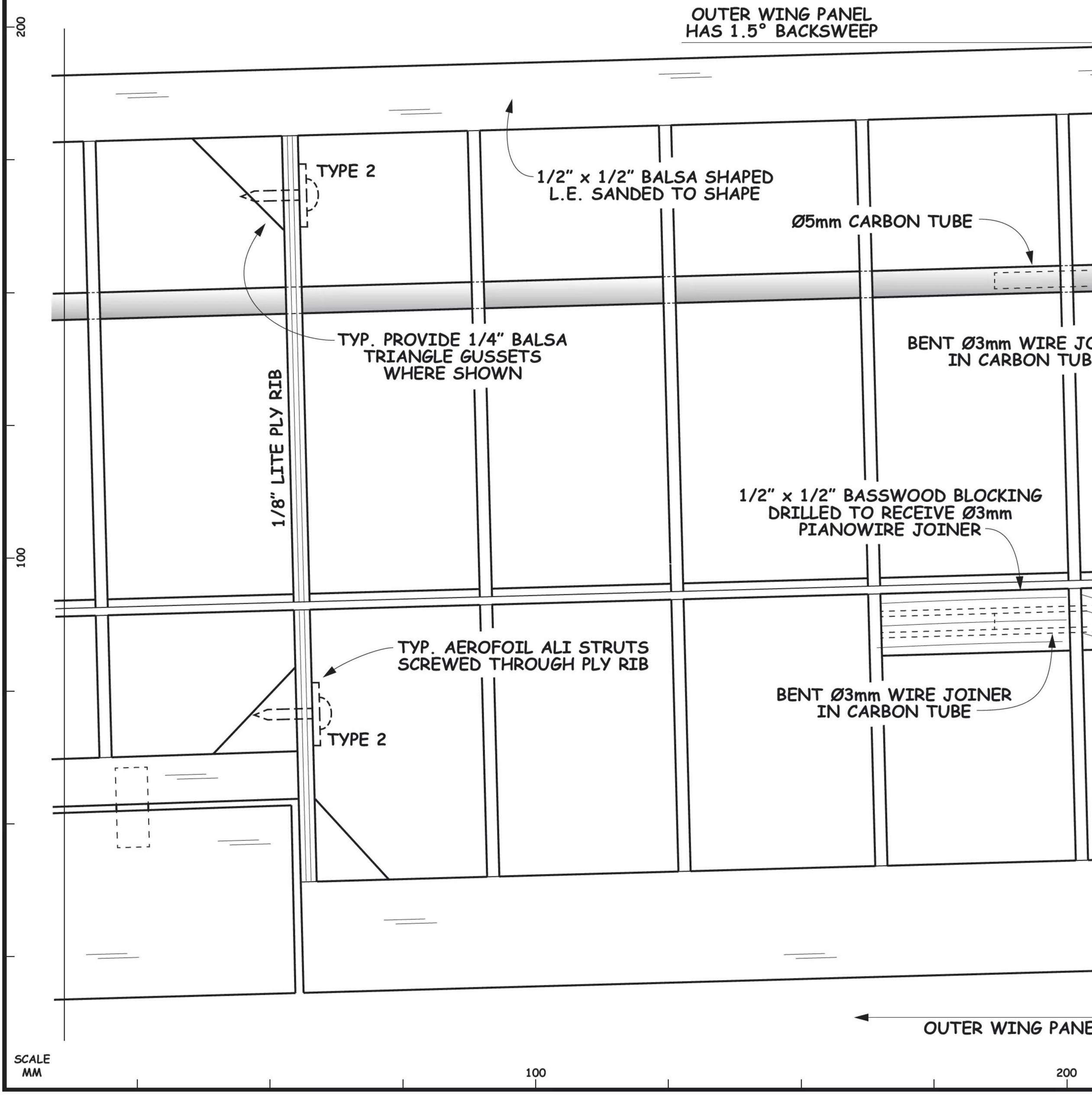
MINI TURNBUCKLE







STRUT END TYPE 1



SEE NACELLE & COWL
DETAIL DRAWINGS

TYPE 2

TYPE 2

APPROX. LANDING GEAR
ATTACHMENT POINTS

1/8" LITE PLY RIB

1/8" LITE PLY RIB

APPROX. NACELLE
ATTACHMENT POINTS

LINE OF NACELLE ON TOP OF LOWER WING
SECURED WITH 4 SCREWS FROM BELOW

1/8" LITE PLY RIB

TYPE 1

BLOCKING
FOR UPPER
FAS

VIEW SHOWS REINFORCING
& BLOCKING BETWEEN RIBS BELOW NACELLE

1/4" x 7/8" BALSA T.E. (WEDGE SHAPE)

EL - LOWER WING

300

400

Ø2mm ALI
TUBE

LINE OF UPPER WING

SIDE ABOVE

FUSELAGE

SIDE ABOVE

FUSELAGE

LE ON TOP OF LOWER WING
H 4 SCREWS FROM BELOW

1/8" LITE PLY RIB

1/8" LITE PLY RIB

PROVIDE BLOCKING IN FUSELAGE
AT 4 CENTRAL ANGLED UPPER
WING SUPPORT STRUTS

1/8" LITE PLY RIB

1/8" LITE PLY RIB

BLOCKING IN FUSELAGE
FOR UPPER WING STRUT
FASTENING

NOTE: L.E, CARBON TUBE,
BUILT UP SPAR & T.E. EXTEND
THROUGH FUSELAGE TO
CREATE CENTRAL BOX

BALSA T.E. (WEDGE SHAPE)

EXTENT OF CENTRAL WING BOX - BUILT THROUGH FUSELAGE

400

500

MINI TURNBUCKLE

THREAD FISHING LINE THROUGH
TUBE TWICE, PULL TIGHT &
FLATTEN TUBE TO CAPTURE WIRE

6mm BASSWOOD
BLOCKING OVER
PERIMETER FRAME

TYPE 2

TYPE 2

3/32" NACELLE
FORMERS

SEE DETAILS
ON OPPOSITE
SIDE FOR BLOCKING
BELOW NACELLE

3/32" CURVED
PERIMETER
NACELLE BASE
FRAME

3/32" BALSA RIDGE
MEMBER UP & OVER
TOP OF NACELLE TO
FRONT SPINE

TYPE 1

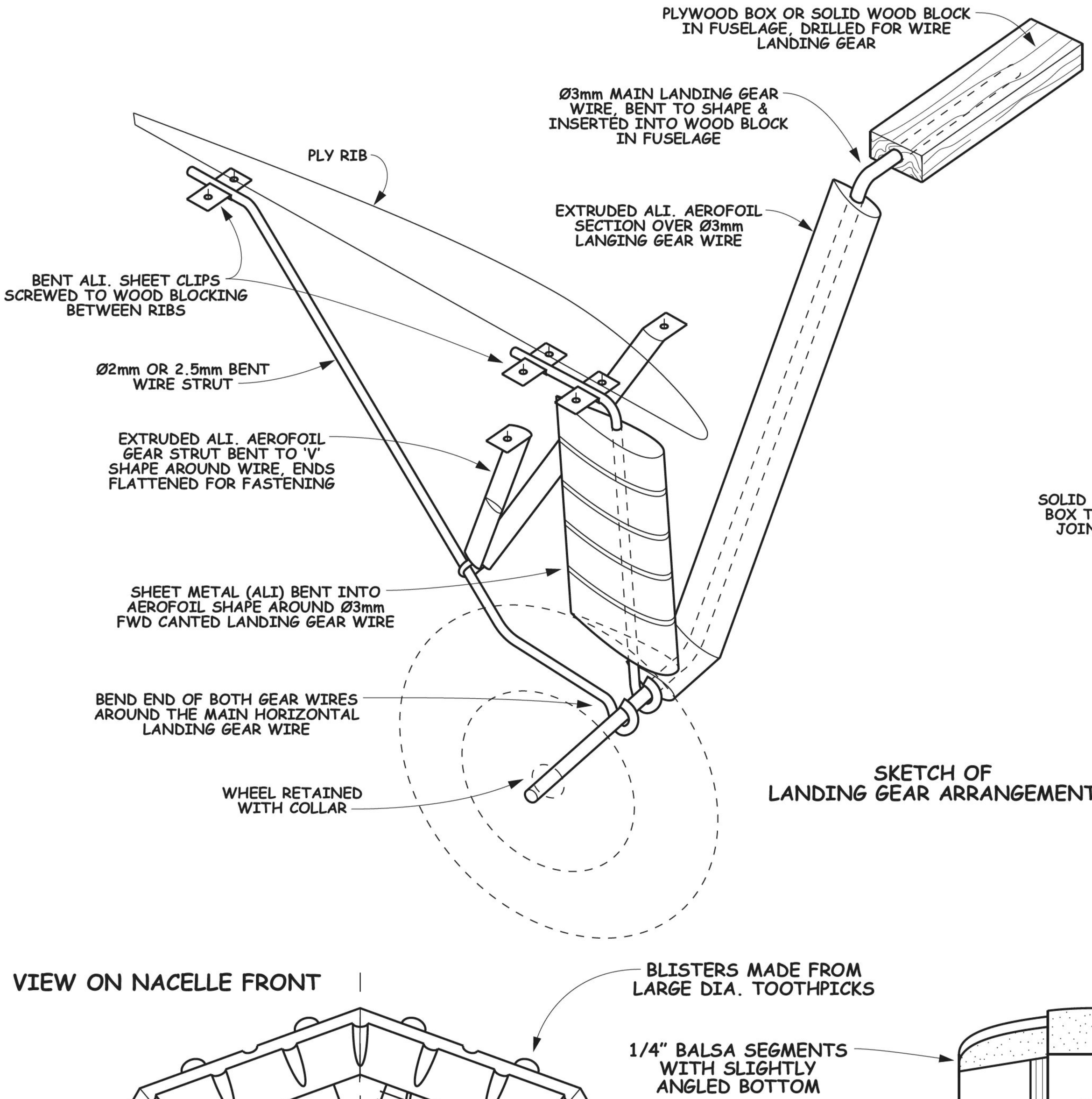
12

16

20

600

700

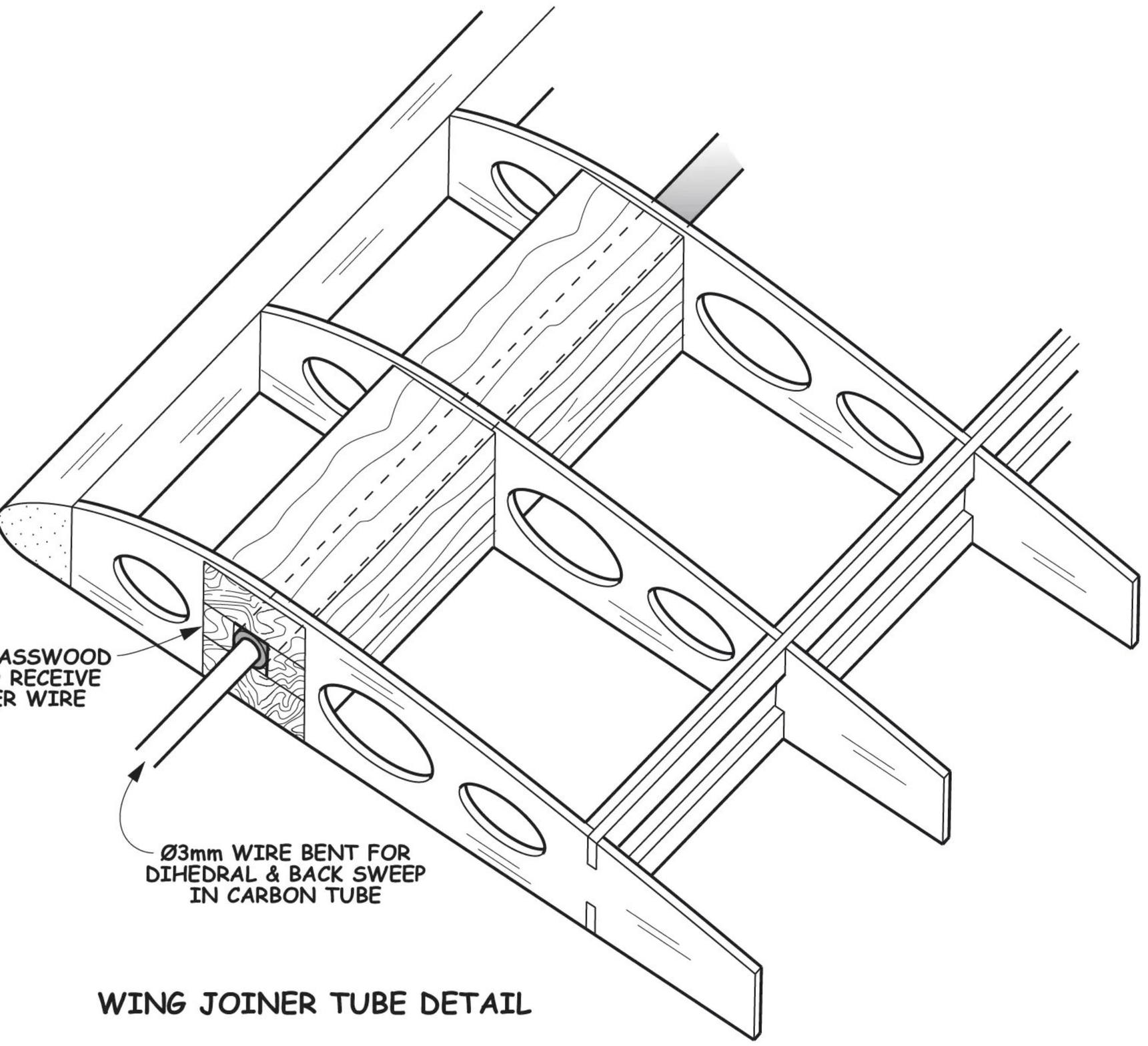


SKETCH OF
LANDING GEAR ARRANGEMENT

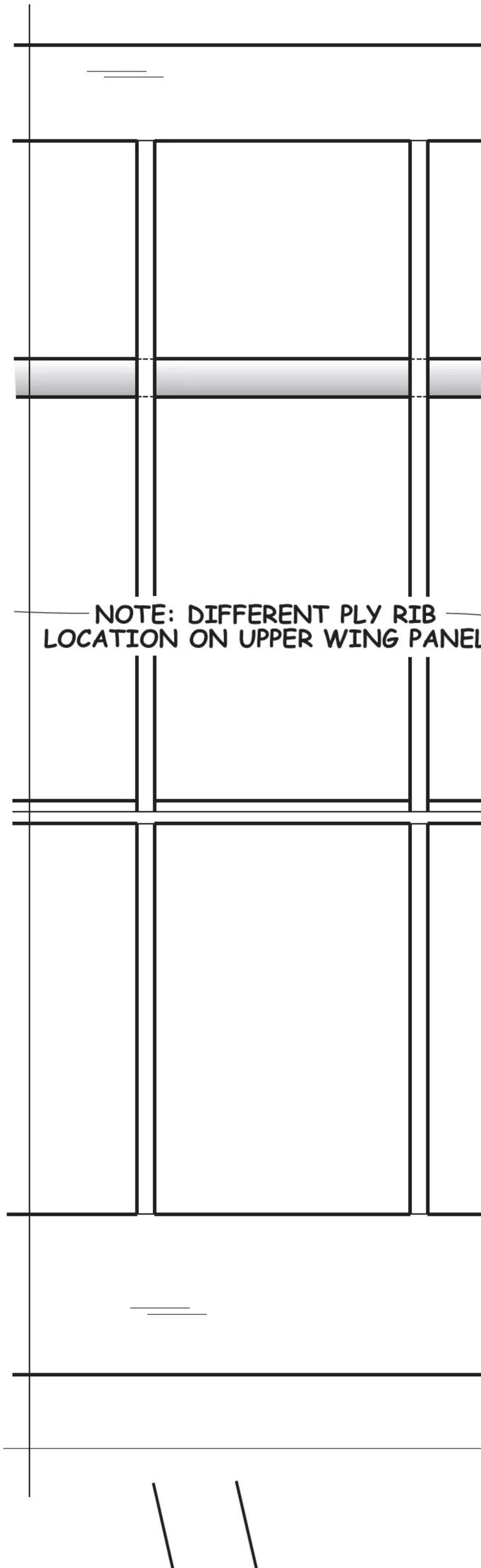
VIEW ON NACELLE FRONT

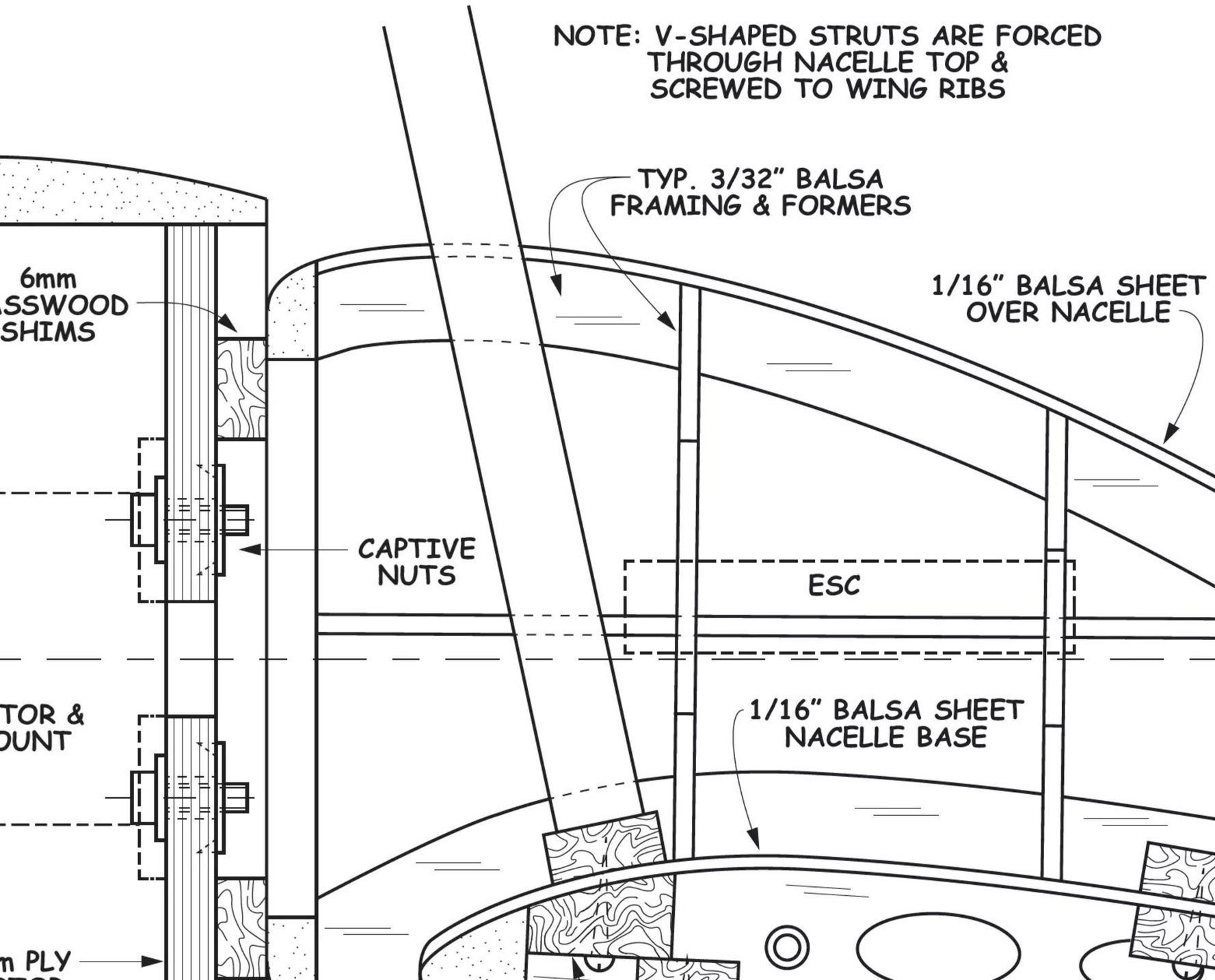
20

16



WING JOINER TUBE DETAIL





16

12

TYPE 1

TYPE 1

1/8" PLY RIB

FUSELAGE SIDE BELOW

FUSELAGE SIDE BELOW

NOTE: DIFFERENT PLY RIB
ATION ON UPPER WING PANEL

EXTENT OF CENTRAL WING BOX - UPPER WING

TYP. STRUT
FWD SLOPE 12°

HEATSHRINK TUBE
FOR FLYING WIRES

USE TIN SNIPS
TO CUT ANGLE

INSERT
HEATSHRINK
TUBE

B
P-7

PLAN No:

PLEASE VISI

PLEA
NO PART OF TH

8

4

SCALE
INCHES

TYPE 1

1/8" PLY RIB

NOTE: DIFFERENT PLY RIB
LOCATION ON UPPER WING PANEL

1/8" LITE PLY RIB

1/8" LITE PLY RIB

TYPE 1

TYPE 1

TYPE 1

4

8

OULTON PAUL
75 OVERSTRAND

BY JON HARPER

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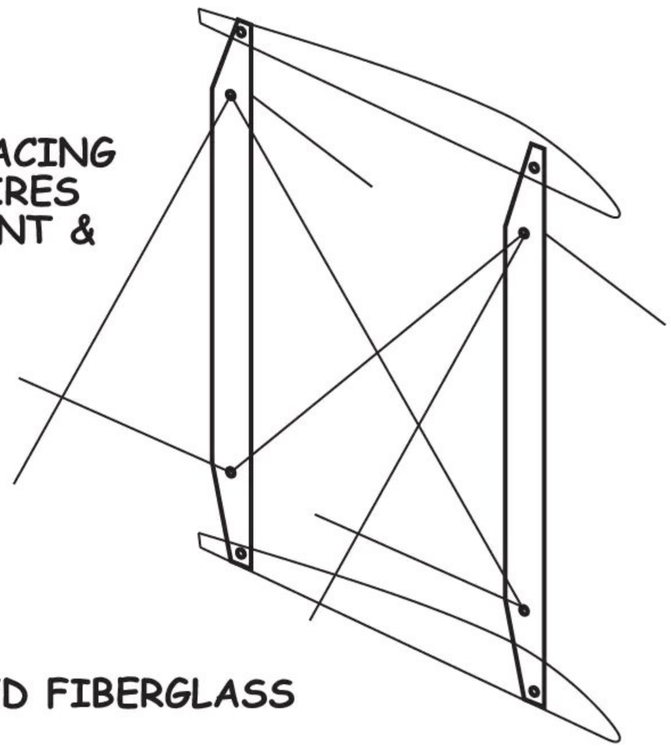
TYPICAL CROSS-BRACING
FISHING LINE WIRES
BETWEEN ALL FRONT &
REAR STRUTS



FLYING WIRE NOTES

1. USE 20lb TEST BRAIDED FIBERGLASS BLACK FISHING LINE
2. AT ALL STRUT HOLES INSERT BLACK HEAT SHRINK TUBING TO PREVENT CHAFING

CUT MID GROOVE ON EACH SEGMENT

1/4" BALSA SEGMENTS SANDED TO SHAPE & RAZOR SAW TO CUT MID GROOVE

MO
MO

6mm
MO
MO

NACELL

3/32" BALSA SHEET ANGLED WING TIP SET AT 40°

TYPE 1

PROFILE

RIB TOP TRIMMED TO SUPPORT ANGLED WING TIP SHEET

1/8" LITE PLY RIB

TYPE 1

SCALE MM

100

200

TOR &
OUNT

m PLY
OTOR
OUNT

1/16" BALSA SHEET
NACELLE BASE

HEATS
FOR FL

1.5° INCIDENCE

8mm THICK BALSA
AROUND NACELLE L.E.
RING, SAND ROUND EDGE

E SECTION

6mm
BASSWOOD
BLOCKING
FOR NACELLE

TYPE 1

1/8" LITE PLY RIB

TYPE 1

CA

TAP
AILE

THREAD BENT WIRE THROUGH
AILERON & MAKE TWIST CONNECTION
ON UNDERSIDE TO Ø1.5mm ALI TUBE
DRIVER ROD

300

400

HEATSHRINK TUBE
FOR FLYING WIRES

USE TIN SNIPS
TO CUT ANGLE

FLATTEN AEROFOIL
SECTION END

INSERT
HEATSHRINK
TUBE

FASTEN
THROUGH
RIB

STRUT END TYPE 2

PLAN No:

PLEASE VISI

PLEA
NO PART OF TH
ELECTRONIC OR MEC
RETRIEVAL

OUTER W
HAS 1.5°

TYPE 2

1/8" LITE PLY RIB

NOTE: ALL UPPER ST
ARE SCREWED FROM B

NOTE: SEE OTHER
FOR COMPON

NOTE: UPPER & LOWER
CONSTRUCTED AS UNI
ALI STRUTS & RIGGING
RECEIVING JOINER
FLYING WIRES ARE C
CENTRAL WING PANEL WI
TO KEEP OUTER WING PANE
SECURE ON UNDERSIDE WI

TYPE 2

CA HINGES (TYP)

TAPERED BALSA T.E.
AILERON 5/16" x 1 1/2"

400

500

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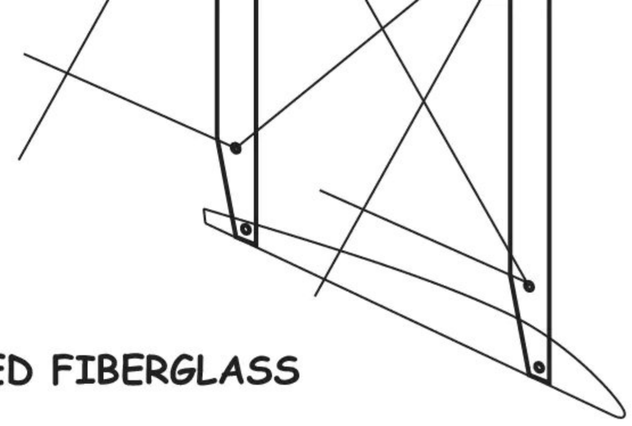

FLYING WIRE NOTES

1. USE 20lb TEST BRAIDED FIBERGLASS BLACK FISHING LINE
2. AT ALL STRUT HOLES INSERT BLACK HEAT SHRINK TUBING TO PREVENT CHAFING
3. PROVIDE CROSS BRACING BETWEEN ALL FRONT & REAR STRUTS
4. TRY TO USE CONTINUOUS FLYING WIRES