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VOL.63 NO.10 OCTOBER 2020

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# WELCOME

Editor: Kevin Crozier. MyTimeMedia Ltd. Suite 25S, Eden House,  
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Fingers crossed most of you will have had the opportunity to enjoy some model flying in recent weeks, despite the problems caused by Covid. I've tried to get out as much as I can but, strangely, I can't get my mojo going for evening flying this year. So, I've mostly been a weekender (as our very own Alex W would say!) but none the less I've enjoyed some very nice and convivial outings with my clubmates.

And there's the rub, I think... At weekends I mostly fly at a small, friendly club about a half hour's drive away. I have to book a slot, so it needs properly thinking about the night before to make sure my Tx and batteries are charged and the models I want to fly are taken out of storage from a nearby lock-up and are complete and ready to fly. Thankfully, I've only forgotten the Tx once or twice, and when I have I've normally got a transmitter - just not the right one!

But during the week I can get a bit absorbed in putting together this much-loved magazine, so by the time I think about charging a few packs and getting my act together for a lazy summer's evening flying session then it's often too late to get all my gear together, especially now that the nights are drawing in. I'm not sure why though, as it's never stopped me in the past - it must be a post lockdown slump sort of thing.

My nearest flying field is just ten minutes away, so it's perfect for a nip out session. I must get my act together before it's too late for this year, although I'll probably be flying my FMS Firefly night flyer by the time you read this! I hope that you will be able to make good use of the late afternoons and evenings left to us for flying in 2020 too!

Talking of forgetting things, one thing I am likely to have a wobble about are LiPos, as I usually go with the flow when building a model, especially foamies, and just use the connectors provided. I did start my electric model adventures with good intentions and retrofitted gold bullet connectors to both the models and batteries, but in recent years I've got a bit lazy and just use what is to hand. So, I've got various set ups fitted with the most popular types of connectors.

So far, so good, but I do sometimes find myself loading up a LiPo, especially the 3S-2200 types that are the most numerous in my collection, only to find a mismatch at the connector.

Fortunately, as I always charge my packs at home these days, I nearly always have a spare pack or two to fall back on. Once or twice it has been a close call though and I've nearly had to abort a flying session.

This is also a reason why I usually take at least two models to the flying field. If something goes wrong, then this means that I have another model to enjoy flying.

Time now for another call to arms, which our loyal readers are usually very quick to respond to. Quite soon I hope to start an occasional series on past review models, of which I am lucky enough to have quite a few in my collection. A few too many in fact, so I am intending to thin out my flock. But before doing so I thought it would be interesting to fly them again to see if my notes on them have changed over the years, and whether I really want to keep them or not. And I do mean years, as some aeroplanes go back to my first stint as Editor of RCM&E back in the early 90s!

If you have owned and/or flown the models to be featured, then it would be great to hear from you with your own thoughts and feelings about them. It would also be good to hear from those with some knowledge of the second-hand market as to their current value, so that we can all build our knowledge of what different types of models are worth when sold on.

To start with I'll be looking at a little and large pair of aerobatic models with a common connection - ace R/C pilot Quique Somenzini, who designed both models. First up is E-flite's Carbon-Z Splendor, followed by the Edge 540QQ 280 BNF, also from E-flite.

Do let me know if you have any experience of each of these models.

Happy Flying!

*Kevin Crozier*



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## ON THE COVER

Photo: Alex Whittaker

In this month's Model Magic, Alex Whittaker pays tribute to a much-respected German scale modeller, Gerhard Reinsch, who recently passed away. This big, yellow Tiger Moth is one of two of Gehard's models that Alex will be taking a close look at. No pilots though, as Alex's photo session took place during early flight trials.



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## FAREWELL, EL TATA



**D**ario Villafañe, whose shots of a five metre wingspan Boeing 767 airliner filled the Parting Shot page at the end of the May issue, has written with the sad news that Cliver 'Tata' Ripani has passed away as the result of Covid.

Cliver was the leader of the large model workshop that built the big Boeing. Called 'El Taller del Tata' (The Workshop of the Tata), they are members of the club 'Agrupación Aeromodelista Pucará', near Buenos Aires.

In memory of Cliver, here are some pictures of the 'El Taller del Tata's' large C-130 Hercules, which Dario took at the Festival 'San Justo Vuela'. The city of San Justo is 560 km from Buenos Aires.

## FLYING SELFIES

*"Did I read recently that you're looking for imaginative flying selfies? If so, here's my submission – it was grabbed from RunCam 2 footage. The RunCam was mounted to the drop tank rail on my 1500mm FMS P47 Razorback on a cold but sunny Scottish winter's day at the Burns Country Flyers club in Ayrshire."*

*Stay safe and keep flying..."*

**Neil, A.K.A. Alginon Bigglesworth**

Thanks for the picture, Neil. We don't remember asking for selfies, but it could make a good topic for our Parting Shot feature at the end of the magazine.

If others follow your lead, then please remember to only pick well focussed shots and capture them at the highest resolution possible. Neil's pic is just about usable at 950KB, but it's a close-run thing. We'll need a nice description, and the camera and settings information, which can normally be found in the EXIF data attached to image files.



More model air to air shots would also be good to see, and maybe soaring birds too if they fly close enough - but please don't chase them just for the sake of a picture.





Bo Hare and the restored Sopwith Tabloid.

## BODDO'S TABLOID

As reported in the August issue, a restoration job on one of David Boddington's original plan models, the Sopwith Tabloid, that he built to feature in RCM&E back in January 1972, has appeared on TV as part of the latest series of *Salvage Hunters: The Restorers*. The episode featuring Boddo's Tabloid was broadcast on Quest on the 5th August.

Following the screening of the episode we asked Andrew Boddington, David's son and the current Editor of *AeroModeller* magazine, for some more details as he was actively involved in the filming. Andrew was also kind enough to provide some pictures - old and new!

"Attached are some more photos now it has been broadcast. The model was test flown by David Toyer up at Deeside MAC, with Drew Pritchard present, but it needed more lead in the nose to make it comfortable to fly. Thus, once the C of G was adjusted, they did some extra filming at the St. Albans club for the flying shots.

October *AeroModeller* will have a behind the scenes article on the preparation and filming of this episode of *Salvage Hunter: The Restorers*.

The black and white photo shows Dad, centre, with David Toyer working on the engine, circa 1971."

Just before the programme aired, we also received a message from Roger Traynor of the St. Albans MAC, about SAMAC's involvement. Roger takes up the story:

"At the end of last year we were contacted by a local engineer, Bo Hare, who was doing restoration projects for the 'Salvage Hunters: The Restorers' TV series. It appeared he had obtained David Boddington's original Sopwith Tabloid (that featured as an RCM&E plan and in several of DB's books and articles) and had been commissioned to restore it and to get David Toyer (who worked with DB for many years) to fly it.



David Boddington and David Toyer prepare the Sopwith for flight.

A cluster of members turned out with WW1 biplanes for atmosphere and, after a lot of fettling, we were able to help David T get a successful flight in for the camera.

I don't know if we'll get much of an acknowledgement out of the show, but we know we did a good support job and will have a warm glow from that. More than on the day - it was cold and damp!"

Although we understand that segments from both filming sessions were used in the final cut, it was Deeside MAC that was most visible on screen. Congratulations, however, to both clubs for their involvement in returning one of David's much-loved designs to the sky.



Above: Presenter, Drew Pritchard (left) and restorer, Bo Hare (right) have an animated discussion whilst pilot, David Toyer (centre) looks concerned at what's occurring at the Tabloid's rear end!



This fine fleet of WW1 models provided by St. Alban's MAC sadly ended up on the proverbial cutting room floor. Photo: Roger Traynor.



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We have chargers that are adapted to a full range of chemistries (LiPo, LiHV, LiFe, Lilon, NiMH, NiCd and Lead Acid) making them suitable for practically any battery type. From the simple RC-3S and NX-20, to the more complex RC-D100 V2, we can provide for enthusiasts new or experienced. All of our chargers are fully compliant with the requirements of the European health, safety and environmental protection legislation, and meet all of the RoHS requirements.

## MOTORS



Built specifically to optimise the performance and power of your aerodynamic applications.

Built using only the highest quality components, from Neodym magnets, to special high temperature wire for windings, these motors are designed to Overlander's stringent and demanding standards. With the use of advanced CNC machine tools, our manufacturers have been able to achieve the unique Overlander motor design that offers minimum weight and enhanced heat dissipation. They are unmatched in quality and value, and the performance speaks for itself!

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# RC-D100V2

## AC/DC DUAL BALANCE CHARGER, DISCHARGER & POWER SUPPLY

The RC-D100V2, is adapted to a full range of chemistries (LiPo, LiFe, LiIon, NiMH, NiCd and PB) and comes with a comprehensive set of leads making it fully-prepared for practically any battery type. It is capable of operating as a power supply, with the maximum output of 100W to help hobbyists power their DC equipment.

The RC-D100V2 comes with a power lead for mains, two XH balance boards, two charging cables, two XT60 charging cables and a power cord for AC. It has been created with automated safety precautions, including a charging current limit, capacity limit, temperature threshold and processing time limit.

This charger is also compatible with both iOS and Android smart phones via a built in Bluetooth, making operation easier than ever. While this charger is specially designed to cater for the higher end user, with the aid of a simple-to-use interface and a complete set of instructions, this charger is by no means limited to experts.



**CHARGE RATE  
10A**

**DC POWER  
100W  
x2**

**AC POWER  
100W**

### COMPATIBLE WITH:

**LiPo  
(1-6S)**

**LiFe  
(1-6S)**

**Li-Ion  
(1-6S)**

**LiHV  
(1-6S)**

**NiMH  
(1-15S)**

**NiCd  
(1-15S)**

**PB  
(2-20V)**

### SPECIFICATIONS:

|                                  |                  |              |
|----------------------------------|------------------|--------------|
| Input Voltage                    | AC: 100-240V     | DC: 11-18V   |
| Charge Circuit Power             | AC: 100W         | DC: 100W x 2 |
| Discharge Circuit Power          | 10W x 2          |              |
| Charge Current Range             | 0.1-10A x 2      |              |
| Discharge Current Range          | 0.1-2A x 2       |              |
| Current Drain for Balancing      | Max. 300mA/cell  |              |
| Trickle Charge Current           | 50mA-300mA & OFF |              |
| DC Power Supply                  | 100W / 13.8V     |              |
| LiPo/LiFe/Li-Ion/LiHV Cell Range | 1-6S             |              |
| NiMH/NiCd Cell Range             | 1-15S            |              |
| Pb Voltage Range                 | 2-20V            |              |

### SCAN TO GO

Using our Charge Tracker V2 app, you can create QR codes to stick to your packs that save and load the charging setting for your batteries.

### POWER SUPPLY

The RC-D100V2 can be used to provide up to 100W/13.8V DC power, allowing hobbyists to power their equipment out on the field.

### VOICE GUIDE

Enable the charger's voice guide mode to make the charger more user-friendly and customizable.



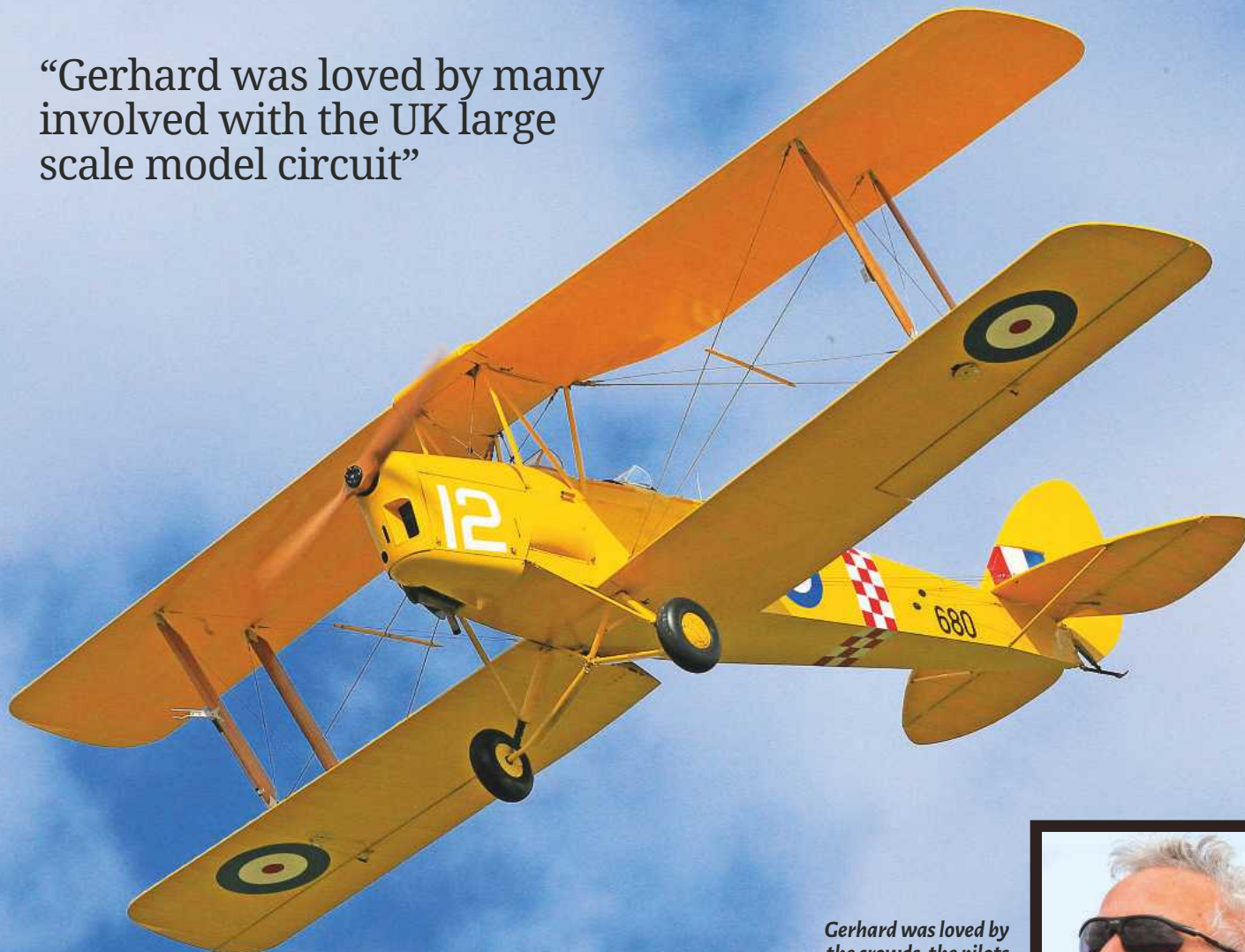
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Scan the QR Code to view on our website!

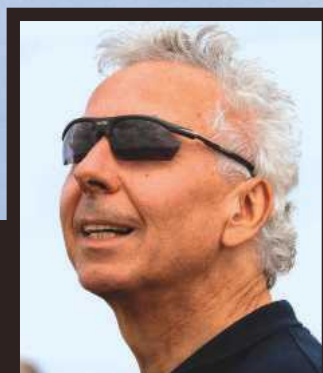




“Gerhard was loved by many involved with the UK large scale model circuit”



*Gerhard was loved by the crowds, the pilots and the press corps.*



# ONE WING OR TWO?

In a double header, Alex Whittaker celebrates two models from ace scale man, Gerhard Reinsch  
words & photos » Alex Whittaker



*Gerhard fettling his Tiger Moth at Little Gransden.*

I was told about the death of Gerd Reinsch only last week (early August). To say I was appalled is an understatement. The person telling me was shocked, and in turn, I was almost disbelieving. Gerhard was loved by many involved with the UK large scale model circuit. His lovely manner and ready sense of humour endeared him to his many UK fans. Most of all, he was famous for his large scale, highly detailed model aircraft which he flew with consummate skill. His collaboration with two other scale geniuses, Toni Clark (Practical Scale) and Paolo Severini, made a stunning Scale Triumvirate. In honour of Gerhard's contribution to scale modelling, I thought it would be fitting to revisit two of his most famous models in one Model Magic. Let's begin with his magisterial Tiger Moth.



### TIGER MOTH

Gerd's Tigger is built to 1:2.8 scale, with a wingspan of 125.6 inches. It was a collaboration between the aforementioned Scale Triumvirate. They based their plan directly on DH factory drawings. The construction is very much like the full size, with steel tube of square and round section. The wings are of wooden construction with steel bracing and fittings, just like on the full-size. Most significantly, the full-size aerofoil is also used. Similarly, the tail has a wooden construction with steel fittings, just like on the full-size. There are epoxy-glass parts, like the wing fuel tank and the nose bowl of the engine cowling. All these moulded items were produced by Toni Clark (Practical Scale).

The Tiger Moth weighs 50 lbs. Since it was the prototype of the Paolo Severini kit released via Toni Clark, it flew with 3 lbs of ballast in the nose to compensate for a heavy tailplane. The production version was projected to weigh just 44 lbs.

Gerhard's Tiger Moth is powered by a mighty Valach VM 120i2-4T inline four-stroke petrol engine of 120cc. There is even a custom-made stainless-steel exhaust. The prop used is a Fiala 30" x 12" wooden design.



*The Toni Clark Tiger Moth is 123" in span.*



*Above: Gerd's Moth flew at 44lbs after a bit of weight trimming.*



*Left and below: These are shots that I got of the phototype in 2015, as yet unfinished and crying out for a P1 and P2.*







*The not quite finished prototype with an empty office reminds me of the DH Queen Bee pilotless target aircraft.*

The superb undercarriage is fabricated from stainless steel tube, ready silver-soldered and included in kit. All the scale fittings, cockpit interior and streamline wires are included in the kit. The model was finished in two component polyurethane paint from the company 'Relius'. All legending and decals are by Paolo Severini.

#### GERD'S FLYING NOTES

*"A dream to fly, no matter if flown slow or fast. Easy to flat spin, recovery is simply by releasing the controls and rotation stops after two turns. Scale take-off and cruising flight is on about 33% power, with a super realistic sound. Full power is good for very big loops and high stall turns. She can also be flown and landed in very strong winds."*



*A truly magnificent DH Tiger Moth model on a slow fly-by.*



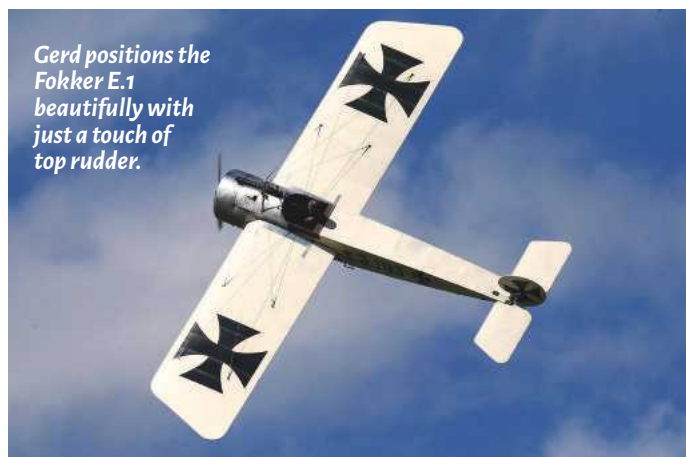
*The Tigger has a wing area of 4,650 square inches - that is three square metres!*



*Gerd was an elegantly tall man - it may look smaller but that huge model is 40% scale!*

## DATAFILE

|                    |                            |
|--------------------|----------------------------|
| <b>Model Name:</b> | Toni Clark Tiger Moth      |
| <b>Scale:</b>      | 1:2.8                      |
| <b>Wingspan:</b>   | 125" (3.17m)               |
| <b>Wing Area:</b>  | 4650 sq.in. (3 sq.m.)      |
| <b>Weight:</b>     | 44 lbs as flown at Cosford |
| <b>Engine:</b>     | Valach VM 120B2-4T petrol  |
| <b>Capacity:</b>   | 120 cc                     |
| <b>Prop:</b>       | Fiala 32" x12" wooden prop |
| <b>Controls:</b>   | Ailerons, Rudder, Elevator |



*Gerd positions the Fokker E.1 beautifully with just a touch of top rudder.*

## "Gerhard's immaculate Eindekker is truly massive"

#### FOKKER EINDEKKER

First and foremost, Gerhard's immaculate Eindekker is truly massive. She is built to forty percent scale and spans a majestic 159". She weighs 44 lbs and is powered by a Valach 120cc petrol engine. This astounding Eindekker was built from the advanced kit from the unmatched Paolo Severini. Paolo has the eyes of an artist and hands of an engineer. His kits have no close competitors. Their quality, fidelity and sheer completeness is unsurpassed.

Paolo worked hard on scale accuracy with the E.1. The model employs exactly the same aerofoil as the original. It also uses exactly the same +6 degree wing incidence. The model's construction faithfully mimics the tubular original. Only metal and wood are used in the model. There is no fibreglass, balsa or carbon composite used in the kit.





*Left: Superb dummy engine to the fore, the Fokker comes in to attack its prey!*

*Below: The dummy Oberursel engine expertly masks a Valach 120 petrol twin.*

Paolo Severini returned to primary historical resources to draw up his meticulous plan. The kit is based on the later production E.1, with the larger aspect ratio wingspan of 10 metres. As per the full-size, the model uses a wire-braced steel tube fuselage. This, and the all moving metal tubed rudder and tailplane, have been sandblasted before finishing.

The wing has plywood ribs threaded on to cedar wood spars. As mentioned, the ribs are a true scale section. The wing also has the full true scale wing warping mechanism. All steel fittings are laser cut and pre-bent ready for fitting. The pilot's joystick is linked to the operation of the controls.

Gerd fitted a Valach VM 120B2-4T twin petrol engine. This was sourced from Toni Clark Models in Germany. It is a four-stroke petrol motor with a capacity of 120cc. The engine has nickel-silicon coated bores and uses Honda valves. It is fitted with a classic Walbro carb, familiar to generations of petrol modellers. The motor uses Valach's own electronic ignition system powered by two LiPo cells. Gerd first flew the model with an exhaust borrowed from an Aeronca C3. It is now fitted with a custom Severini exhaust. This exhaust, coupled with four-stroke petrol operation and that big prop, delivers an exceptional sound. It has quite a bark when run on full throttle. Gerd chose a Fiala 32" x 12" wooden prop.



*Right: Fully articulated scale undercarriage with rubber bungee suspension.*



*The Paolo Severini kit builds very quickly into an exceptionally detailed model.*



*Gerd's model is covered in woven polyester ProfiCover. All decals are painted with Relius brand paints.*



*Crisp, authentic detailing on the all-moving rudder and elevators.*

The aluminium cowl is supplied preformed, as are the cowl's side fairings. A scale-like engine-turned finish is used. The superb fuselage cowl is from light aluminium sheet, of a heavier gauge than litho. The fully articulated undercarriage is true scale and fully functional. It uses rubber shock absorbers, bungee style. Gerd used scale wheels from a Toni Clark Albatros.

The model has no ailerons. In authentic scale fashion she uses wing warping. This also means that the control stick is directly connected to the surfaces. The pedals are also connected to the elevators. Elevators and rudder can be easily removed for transport. All fixtures, fittings, cables, terminations and turnbuckles are faithfully reproduced in the kit. Gerd used an adhesive backed woven polyester fabric called ProfiCover for the model. This is available from Toni Clark. Its particular property is that it shrinks more tightly along the roll than across it. Gerd painted the model with two-pack polyurethane from the Relius paint company.

#### GERD'S FLYING NOTES

*"On each and every flight she looks utterly entrancing. The wing warping is surprisingly effective, and the sound of that big engine is addictive. It is not a rotary like an Obersursel, of course. However, it supplies a big throaty sound that becomes even more authentic as when one blips the imaginary magneto on slow approaches..."*

#### GERD THE SHOWMAN

Gerd was a superb pilot and a real showman. One of his party pieces with the Fokker was extended inverted flight. I have to say, scale or not, an inverted Eindekker is something to behold. However, Gerd's most chilling manoeuvre was to dive the model vertically on full power, then flip her through a 90-degree pull-out at just above the deck.



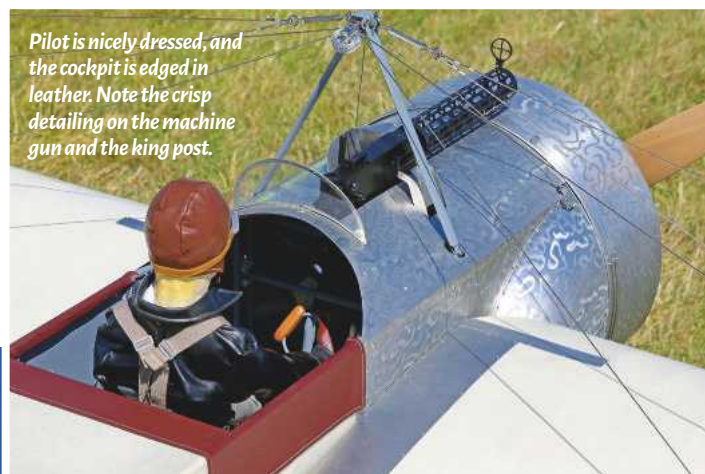
**"Gerd was a superb pilot and a real showman"**



*My favourite angle for any Eindekker really shows off the essentials of the design.*

The G-forces this inflicts on the airframe are truly eye-watering but the Severini metal construction just shrugs it off.

My favourite memory of Gerd's flying was from 2015, at the Little Gransden Willis Warbirds Meeting. Watching his model slip over the boundary hedge in the gloaming, with the wind in her wires and her engine burbling away softly, was a rare treat. ✈️



*Pilot is nicely dressed, and the cockpit is edged in leather. Note the crisp detailing on the machine gun and the king post.*

## DATAFILE

|                    |                             |
|--------------------|-----------------------------|
| <b>Model Name:</b> | Toni Clark Eindekker E.1    |
| <b>Scale:</b>      | 1:2.5                       |
| <b>Length:</b>     | 108" (2.74m)                |
| <b>Wingspan:</b>   | 159" (4.04m)                |
| <b>Weight:</b>     | 44lbs as flown at Cosford   |
| <b>Engine:</b>     | Valach VM 120B2-4T          |
| <b>Capacity:</b>   | 120 cc.                     |
| <b>Prop:</b>       | Fiala 32" x 12" wooden prop |
| <b>Controls:</b>   | Wing Warping and elevator   |

*Gerd was not afraid to put the Fokker into hazardous attitudes at high speeds.*





62" Span Typhoon  
Electric or 0.65 IC

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £79.00  |
| Wood Pack     | £62.00  |
| Complete Pack | £191.00 |



## What's NEW

Our new EDF Mini Jet series designed for 50mm EDF and 3S/4S batteries. See web site for further details

Complete Pack -Plans, CNC Pack, Wood Pack and Canopy £69.00 Each



72" Span Lancaster  
4x 200w Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £34.00  |
| CNC Pack      | £75.00  |
| Wood Pack     | £75.00  |
| Complete Pack | £199.00 |



66" Span Lysander  
0.52 IC or Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £60.00  |
| CNC Pack      | £81.00  |
| Wood Pack     | £42.00  |
| Complete Pack | £198.00 |



42" Span BAE Hawk  
68-70mm Electric DF

|               |         |
|---------------|---------|
| Plans         | £22.00  |
| VAC Set       | £42.00  |
| CNC Pack      | £57.00  |
| Wood Pack     | £37.00  |
| Complete Pack | £153.00 |



78" Span Vulcan  
2x 90mm EDF

|               |         |
|---------------|---------|
| Plans         | £55.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £128.00 |
| Wood Pack     | £154.00 |
| Complete Pack | £362.00 |



104" Span HP Halifax  
4x.32-40 IC or Electric

|               |         |
|---------------|---------|
| Plans         | £50.00  |
| VAC Set       | £63.00  |
| CNC Pack      | £170.00 |
| Wood Pack     | £127.00 |
| Complete Pack | £395.00 |



63" Span MK9 Spitfire  
0.65 IC or Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| Canopy        | £14.00  |
| CNC Pack      | £86.00  |
| Wood Pack     | £61.00  |
| Complete Pack | £179.00 |



86" RetroJet Turbine  
Trainer (80 size)

|               |         |
|---------------|---------|
| Plans         | £39.00  |
| Nose cone     | £16.00  |
| CNC Pack      | £161.00 |
| Wood Pack     | £67.00  |
| Complete Pack | £273.00 |



72" Span Avro York  
4x 200w Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £31.00  |
| CNC Pack      | £112.00 |
| Wood Pack     | £63.00  |
| Complete Pack | £221.00 |



134" Span Lancaster  
Electric or 4x0.52IC

|               |         |
|---------------|---------|
| Plans         | £60.00  |
| VAC Set       | £75.00  |
| CNC Pack      | £148.00 |
| Wood Pack     | £186.00 |
| Complete Pack | £449.00 |



72" Span MK 5 Spitfire  
1.20 IC or Electric

|               |         |
|---------------|---------|
| Plans         | £30.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £109.00 |
| Wood Pack     | £75.00  |
| Complete Pack | £239.00 |



78" Span Turbine  
Vampire (80 size)

|               |         |
|---------------|---------|
| Plans         | £55.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £179.00 |
| Wood Pack     | £101.00 |
| Complete Pack | £360.00 |



103" Span Hurricane  
62cc Petrol

|               |         |
|---------------|---------|
| Plans         | £60.00  |
| Can. / cowl   | £90.00  |
| CNC Pack      | £165.00 |
| Wood Pack     | £160.00 |
| Complete Pack | £465.00 |



72" Span Boeing B-17  
4x 200w Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £79.00  |
| Wood Pack     | £63.00  |
| Complete Pack | £192.00 |



60" Span FW-190A  
Electric or 0.75 IC

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £47.00  |
| CNC Pack      | £77.00  |
| Wood Pack     | £59.00  |
| Complete Pack | £198.00 |



98" Span Turbine  
Vulcan (80-120 size)

|               |         |
|---------------|---------|
| Plans         | £69.00  |
| VAC set       | £95.00  |
| CNC Pack      | £215.00 |
| Wood Pack     | £215.00 |
| Complete Pack | £574.00 |



67" A6M2 Zero  
Electric or 0.75 IC

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £72.00  |
| Wood Pack     | £56.00  |
| Complete Pack | £178.00 |



72" Span Sunderland  
4x 200w Electric

|               |         |
|---------------|---------|
| Plans         | £27.00  |
| VAC Set       | £32.00  |
| CNC Pack      | £79.00  |
| Wood Pack     | £93.00  |
| Complete Pack | £221.00 |



62" Span Hurricane  
Electric or 0.65 IC

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| Canopy        | £14.00  |
| CNC Pack      | £78.00  |
| Wood Pack     | £83.00  |
| Complete Pack | £190.00 |



72" Span DC3 Dakota  
2x 600w Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £40.00  |
| CNC Pack      | £74.00  |
| Wood Pack     | £62.00  |
| Complete Pack | £191.00 |



76" Span A400M  
4x 500w Electric

|               |         |
|---------------|---------|
| Plans         | £30.00  |
| VAC Set       | £47.00  |
| CNC Pack      | £96.00  |
| Wood Pack     | £78.00  |
| Complete Pack | £241.00 |



66" Span Harvard  
0.65 IC or Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £35.00  |
| CNC Pack      | £79.00  |
| Wood Pack     | £63.00  |
| Complete Pack | £192.00 |



61" Span P-51B & D  
900w Electric

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC set       | £35.00  |
| CNC Pack      | £75.00  |
| Wood Pack     | £64.00  |
| Complete Pack | £189.00 |



50" Span BAE Hawk  
for 90mm EDF

|               |         |
|---------------|---------|
| Plans         | £35.00  |
| VAC set       | £51.00  |
| CNC Pack      | £78.00  |
| Wood Pack     | £45.00  |
| Complete Pack | £199.00 |



New 'ACE' range of half-bodied pilots

## Other Models In Our Range

|                    | Plan Price |                     | Plan Price |
|--------------------|------------|---------------------|------------|
| 40" BAC Hawk       | £14.00     | 40" Cosmic Wind     | £14.00     |
| 40" Vampire        | £14.00     | 30" Fokker D7       | £14.00     |
| 58" Aerovan        | £16.00     | 32" Corsair         | £14.00     |
| 38" Mosquito       | £14.00     | 32" Mitsubishi Zero | £14.00     |
| 38" Mosquito TA154 | £14.00     | 40" Cosmic Wind     | £14.00     |
| 47" Mosquito       | £16.00     | 40" Midget Mustang  | £14.00     |
| 46" Spitfire       | £15.00     | 24" EE Lightning    | £14.00     |
| 30" SE5a           | £14.00     | 24" MiG 25 Fox Bat  | £14.00     |
|                    |            | 57" Miles Aerovan   | £25.00     |



49" Span Vulcan  
DF or pusher

|               |         |
|---------------|---------|
| Plans         | £25.00  |
| VAC Set       | £32.00  |
| CNC Pack      | £83.00  |
| Wood Pack     | £58.00  |
| Complete Pack | £188.00 |



72" Span  
Mosquito

|               |         |
|---------------|---------|
| Plans         | £35.00  |
| VAC Set       | £30.00  |
| CNC Pack      | £131.00 |
| Wood Pack     | £87.00  |
| Complete Pack | £273.00 |



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

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*Antares' compact size is evident here. The model is restrained by a strong cord slipped around the tail skid during the start-up saga. The pilot is sporting the latest fashion in flying gear. It's not easy being an icon.*

# GONE FLYING

Out of lockdown, Tim Hooper heads for the flying field to test fly some recent new builds and refurbis

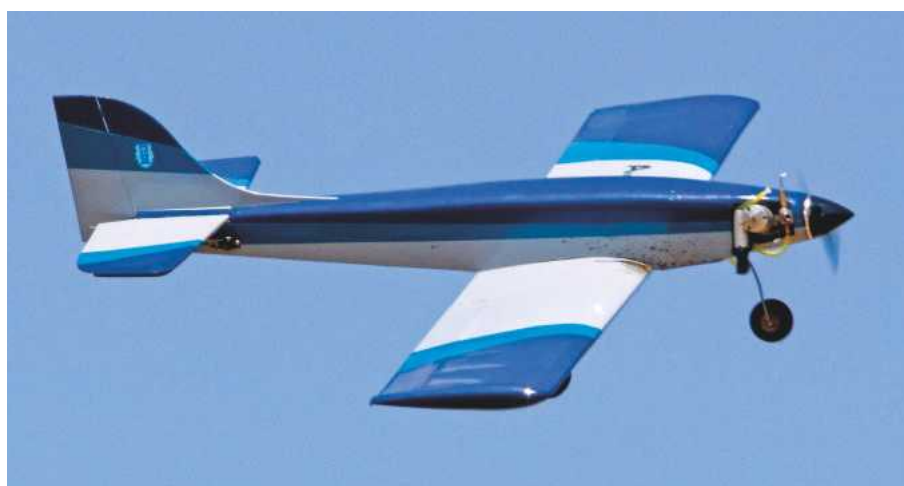
words & photos » Tim Hooper

**B**limey, that's a bit of a game-changer, isn't it? In fact, it's a world-changer. We'd better have a bit of a catch up.

The Covid 19 pandemic has hit many hard, especially in areas of high population density and low wages. At the moment the Hooper household is holding steady. A week after moving to a new house in March, Netty had her ankle replacement procedure. But a week later and the world is in lockdown, with no non-urgent surgical procedures and no house moves possible. So, we've been lucky, and are very much aware of that fact.

Flying wise it was a no-go for several weeks. Our field was shut, just as you'd expect when the weather turns gloriously sunny. Yes, I know that it would be possible to maintain the required social distancing on the flight line, but the clubhouse and pits could be problematical, and it simply wasn't worth the risk.

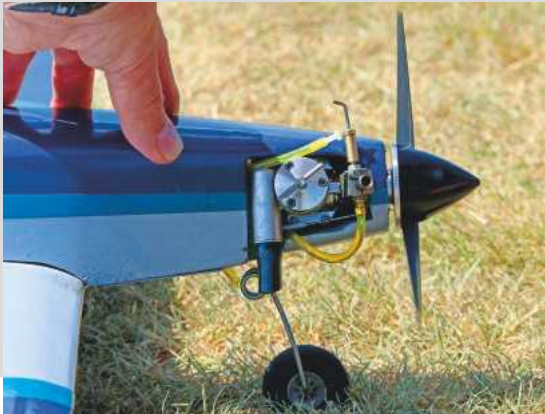
So, what to do in this unlikeliest of global scenarios? There were three models that still awaited maiden flights since being completed last year. First, there was the Keil



*The 38" Antares is a rapid little aeroplane and consumes alarming amounts of sky in the process. Full marks to lensman Rich Harris for getting these in-flight shots so competently.*

**"The PAW 1.49 hadn't been run for several months and had dried up a little"**





*Just to refresh the collective memory, here's the spanking new PAW 1.49 diesel, nestling in its lair. There's a knack to starting it but once running it's quite a tractable little powerplant with a wide throttle range.*



*There's no point in having a symmetrical wing section if you're not prepared to use it. The Antares38 isn't bothered which way up it is when in flight.*

Kraft Ladybird electric free-flight; second, the diesel-powered Antares38 aerobat and, third, that Bird of Time inspired glider, the Sunbird. All were ready and eager to go for some weeks but had to await their moments of glory in my new hangar for the moment.

So, let's kick off this column by backtracking to last autumn for a minute or two, by finishing the tale of my down-scaled Antares aerobat.

### ANTARES38

You might recall that the new, smaller Antares was inspired by my old brown bruiser that succumbed to glue fatigue whilst on an inverted low pass. The new baby is a 70% re-size and is equipped with the very latest in motive power tech in the shape of a 1.5cc PAW diesel engine. Let's get back to the plot.

After waiting patiently for several months, the little Antares38 finally made its first foray to the newly reopened club field for engine testing, and the tempting possibility of a first flight if everything went well.

Our club boasts a small, fenced off area that's set aside for tethered engine fettling, so the Antares38 was tied down to a dog spike and fuelled up. Given that the model only has room for a 2oz tank, I've found that it's a simple matter to use a 20ml syringe, equipped with a fuel tube extension, to load up the tank with a couple of squirts of fuel.

The PAW 1.49 hadn't been run for several months and had dried up a little, so a splash into the air intake, followed by several turns of the prop, freed it up nicely. I'd already run the engine on a test bench previously and had developed a sort of regimen to allow easy starting; fuel up, finger choke and turn over to fill the feed pipe, a quick prime and then a few flicks to start it.

Now, that's all very well when you're working at a waist high bench in the garden. But it's different when the installed engine is

cowled into the nose of a model that is sat on the ground, as any IC man will tell you.

Well, I flicked and primed repeatedly, flooded the engine, backed off the compression, flicked it dry, primed again, increased the compression, etc. Yes, it fired and ran briefly, then it backfired and stopped. All very frustrating. It would only fire and run if the compression was backed off so far that it died before I could get behind the prop to increase the compression to keep it running.

I know that all of this is nursery stuff to the senior diesel hands out there, but I was knelt on the ground, complete with aching back and knees, for some time before the engine actually kicked and ran properly. Not one to miss an opportunity, and given the emptiness of the flight line, I grabbed the transmitter and the idling model, and headed directly for the pilots' box.

Pointing the Antares into wind (there's no steerable nosewheel, remember), I gently pushed the throttle open and was delighted to find that the model tracked pretty straight as it barrelled along the strip. A touch of up and we were away, at last!



*The nasty, gunky exhaust residue is all part of the deal and is considered as a kind of ambrosia by many senior modellers.*

Just a single flight that day but one that included a few obvious elements, including a stall test (benign) and a hands-off dive test to check the CG (just about right). Oh, and a loop and roll to make sure I could still remember how to fly a toy aeroplane after all those weeks of home rule.

After five minutes or so I throttled back for a landing and brought the model in reasonably smoothly. I was able to taxi it back towards the vacant flight line, furtively juggling the elevator, rudder and throttle controls to maintain steerage on the ground.



*The new engine stalled when throttled back on final approach so the dead stick landing was a tad awkward. No damage done.*







*Still a favourite after 15 years or so, the 63" Super Scorpion is enjoying a new lease of life with its new powertrain.*

The Antares' second outing was scheduled as a photo shoot. Gyromeister, Rich Harris accompanied me on a glorious May afternoon to a suspiciously empty club field, so we could get some pics of several models. The gusty breeze was warm in the blazing sun.

Again, the little PAW in the Antares proved hard to start. Rich has subsequently put together a video montage of the afternoon's flights, just to show the funny side of the whole procedure:

[www.youtube.com/watch?v=rqR5EyS0tGw](http://www.youtube.com/watch?v=rqR5EyS0tGw)

Two more flights were eventually completed. In the air the scaled down model is great; the enlarged ailerons and rudder are proportionately more effective than on the original, larger Antares and it grooves really nicely.

The little PAW is never going to provide great surges of power to allow never-ending verticals, but there's plenty of momentum available for largish loops and bunts. Rolls are quite rapid, albeit a tad barrelly.

The engine seems to be pretty reliable in the air and throttles back reasonably well, although if it's allowed to cool too much it will tend to falter and quit, which is par for the course, I'm told. But still, there's the problem with achieving a reliable start-up procedure. I mean, it was fine on the bench, wasn't it - even with the engine sidewinder mounted? Back at home, I hit the internet for suggestion to affect a cure...

### TANK POSITION

I stumbled across a video, produced by PAW themselves, and the very first thing mentioned was tank position. If the tank is too high then you get all the symptoms that I'd been suffering due to the engine continually flooding when the tank is full and the fuel level is above the spray bar. Obvious really, when you think about it.

Now, if I'd obeyed protocol and mounted the engine vertically the spray bar would, by default, be above the level of fuel when the tank was full. But, because Clever Clogs here had laid the engine on its side then the spray bar is always going to be drip-fed when the

tank, sited on the centreline, is full.

This isn't a problem when the engine is running, just when it's sat on the deck. It's not possible to lower the tank in the Antares' skinny nose, so we need to find an alternative solution.

Most brutally, there's the option of sawing the nose off, re-fitting the engine in an upright position and then re-building the cowl - and throttle linkage, fuel feed, etc. - which is not a job I'd relish, if only because it would spoil the Antares' sleek side profile.

The other option is to forego starting the model on the ground and go all control line by holding the model in the hand at a 90° angle, with the cylinder pointing skywards. Whether this is possible to do solo is questionable safety-wise to my mind. But then, if this were a free flighter, it would be normal practice, wouldn't it?

To be continued sometime...

### MORE SUPER SCORPION

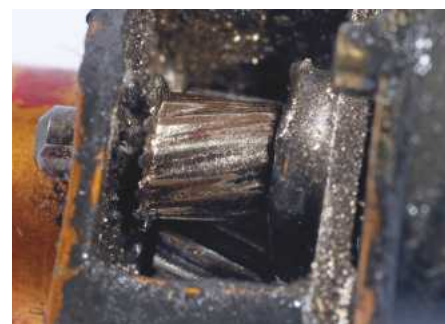
You might recall that a few issues ago I was smugly blithering away about my re-born Super Scorpion. I'd built the model over 15 years ago and powered it with a (then) state-of-the-art Astro15 brushed electric motor, powered by 12 huge sub-C NiCads.

The custom-shaped packs lived their life out and then the big Scorp found its way to the back of the hangar for a few years. Eventually it was hauled back into the light



*Dead Astro15 on the right. Centre stage is the dismissed Astro 05. On the left is the chosen E-flite15 outrunner - quieter, lighter and more powerful than the others.*

**"It's still a pleasure to fly and is one of the prettiest models in the fleet"**



*There used to be teeth on that bronze pinion. The brushed Astro15 let go suddenly in flight, coating everything in a fine mix of grease and swarf. Nice!*

and given a new 3S LiPo battery. Not content with that, I ventured into higher-voltage territory and fitted a 4S 4000mAh instead. The difference in climb rate was little short of remarkable, although the old-school geared motor was making a noise like a deranged banshee.

Well, shortly after the last episode was published the motor's ancient drive pinion gave up the ghost and shed its oily bronze teeth generously over the inside of the Scorp's fuselage, and the model was taken back the workshop for some appropriate rumination. The Astro15 was toast and needed replacing, that much was clear. Back at home I dug out another Astro motor, this time a smaller 05 model, which looked quite promising, but which was rejected as being not quite up the job. Rooting through my stock of old motors I stumbled upon an E-flite 15 outrunner, which I reckoned would



*E-flite15 in its new home. Hidden below is a 3oz slug of lead to offset its lack of weight, the penalty of having a short nose in a world of lightweight power.*





*Left: Goodbye, you lot. Shorted flat and with their leads cut off, this tranche of old packs are on their way to LiPo heaven.*

*Below: George at 4-Max supplied this bundle of new LiPos in short order. He, and his packs, come highly recommended. Initial flight testing looks very good.*



do the job admirably. This motor came out of a dead Pulse15 ARTF and was originally designed to spin a 12 x 8 prop on 3 cells. However, I know from experience that it's happy to run on four cells, as long as the prop load is reduced by fitting an 11 x 7 prop instead, and that there's plenty of airflow over the 40 amp ESC.

Now, the E-flite 15 is a lot shorter and lighter (by some 30z) than the extinct Astro lump. Not only that, but the motor was set up for reversed fitting, with the shaft protruding from the rear of the bell casing. Releasing the grub screws that secured the shaft in the bell let me push the shaft through, using a vice, so the shaft came out of the mounting flange end instead. Easy-peasy.

The firewall needed to be re-drilled for the four bolts to mount the motor and the easiest way to access the firewall was to slice off the outer balsa nose block that was glued to the front of the firewall. The supplied aluminium X-mount that was fitted to the outrunner was unscrewed and binned, to maximise the length of the output shaft. Once again, the gubbins box received a severe rooting to find a suitable prop adapter.

Uncharacteristically thinking ahead, I epoxied a 30z billet of lead in the nose, to make up for the reduced mass of the new motor. The original Jeti 350 (brushed) ESC was honourably retired and a 40A Turnigy item used to replace it.

With the motor removed again, I made up a new balsa nose block, which was shaped and covered in deep red film to replace the old nose, to maintain the overall look of the model.

Job done, and the big Scorp was taken back to the field and put to the test. Just to make a comparison, in its original NiCad powered guise the Scorpion used to trundle across the grass for twenty yards or so before leisurely nudging itself into the air. That's all changed and now we can get airborne in half that distance and go straight into a 45° climb out. Mind you, that sort of launch looks a bit ugly and out of character, so it's prettier to

take off at half throttle and then ease back a bit once the wheels are clear of the strip. Flight times on the 4S 4000mAh are long and I get a bit bored after 20 minutes, I'm almost ashamed to say.

So, once again, one of my favourite elder models has had second mild refurb and, hopefully, a new lease of life for the coming years. It's still a pleasure to fly and is one of the prettiest models in the fleet, so I'd like to keep it functional for a long time to come.

### MOTIVE POWER

Solely because I've been a very good lad in recent months, I decided to award myself some nice new LiPo packs for the existing fleet. Over the years I've bought new packs piecemeal, as and when I needed them. Being congenitally idle, I've just kept the old, knackered packs on a shelf and not bothered to dispose of them properly. Shame on me.

Previously, my packs have been bought from a variety of cut-price suppliers, either online or at shows, and they've either puffed or failed over time. That's probably due to my atrocious habit of storing them fully charged, which, apparently, is a bad idea. On the other hand, I've never had a pack fail suddenly. Neither have I ever had a pack catch fire, either on the ground or after a really bad crash. Believe me, I've tried really hard, too!

The decision was made to rationalise my needs as well. Since I field-charge from a couple of

**Battery killing for beginners. 21watt car bulbs, either singly or in series, will kill your puffed old LiPos prior to safe disposal. You know it makes sense.**

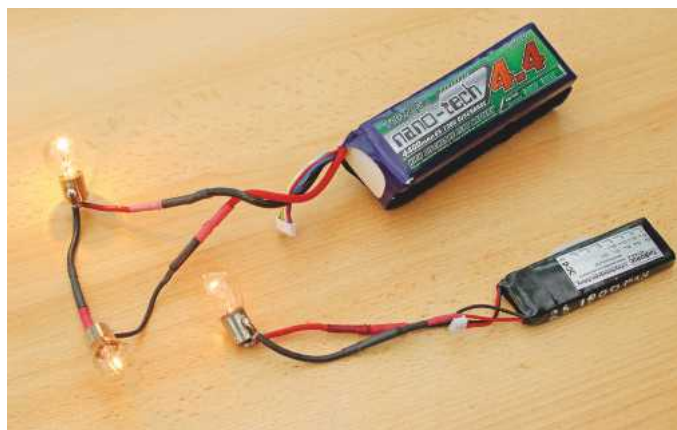
whopping great caravan batteries as I go along, I don't need to have six of every LiPo size I use to last through the flying session. In practice, a couple of each type will suffice quite nicely, thank you very much.

I thought I'd try a new vendor, so I placed my online order with George Worley at 4-Max, a firm I'd not purchased from before. I received a call from George himself, to confirm a couple of details, which I thought was indicative of great service. I'll let you know how the new cells perform as time passes.

### INDICATOR BULBS

However, this new situation left me with a whole tranche of over twenty packs to discharge and then dispose of. My chargers all feature a discharge function as normal, but they'll only discharge a pack down to 3V per cell, and I wanted to discharge each pack down to zero.

Shorting them out through the connectors was obviously going to be a no-no, being potentially explosive and dangerous, so I needed a way of letting them down gently, without causing too much emotional trauma to the poor things.







*My new conservatory-based work bench at our new home. The Charlatan aerobat is in the dock for a general once over, before a belated start to the season.*

This isn't a new idea, by any means, so stop me if you've heard it before. Remember when motor cars were fitted with conventional light bulbs at their corners, before the automotive world adopted the LED as a matter of course? Well, those 21 watt indicator bulbs lend themselves to a new life as Weapons of Discharge for dead LiPos.

I rummaged around in the Brown Cupboard and found three spare bulbs. Out came the soldering iron and fly leads (sporting my favourite 4mm connectors) were attached to each bulb, all ready for use.

Now, a single 12V 21 watt bulb is happy to discharge either a 2 or 3 cell LiPo without demur, and will also do the business on a 4S pack that's already been discharged down to 12V. However, killing a big 5S pack takes two bulbs, wired in series, to do the job. To be fair,

this is quite a lengthy process. There's a lot of residual grunt inside a hefty 5S pack, so it took several hours to reduce the voltage to the required one volt per individual cell. Don't be fooled that the job is finished when the bulb ceases to glow as there are still quite a few electrons knocking about that need to be quashed permanently, so keep it connected until a voltmeter confirms end of life. Oh, and it goes without saying that the above process all took place in the middle of the patio, well away from anything combustible.

Right then, let's get connectors attached to those new 4-Max packs and see how we get on!

#### MOVING ON

Our new address has called for a new workshop, obviously. After a bit of



*My major vice. Yes, I know it's a rubbish joke, but it still makes me smile, okay?*

domestic negotiation, I've been granted the run of the large conservatory as a new playroom. I've plumped to use an old office desk as my new building bench in one corner, whilst behind me is an existing kitchen type worktop and drawers, which now serve as a base for my major vice. The other, seldom used, power tools reside on another bench inside the garage/hangar.

I've organised supplemental lighting over the bench, six electric sockets and a hefty fan heater below for when the nights turn chilly. What I'm missing is the old set up for taking studio type photos against a plain white backdrop, so we'll see how we get on with using the desk itself. Mind you, there's been a couple of comments on the model flying fora recently asking for more everyday realism in the mag's photos, so this could be the ideal opportunity to make a change for the simpler.

We've also been blessed with a generous garage and I've claimed the back wall for hanging hangarage.

#### NEXT TIME

In the next Bench Blog, I'm hoping to finish the tale of that modified HK Sunbird leccy glider, as well as take a complete 90° shift and head off into esoteric world of rubber fancying! ✈

“...this new situation left me with a tranche of over twenty packs to discharge and then dispose of”



*Lucky me! I get the rear half of the garage to store my toys. Quite a few old friends in evidence. That wing rack is worth its weight in gold.*



*The fleet has been gently thinned out recently. Those that are left have earned their hanging space.*





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“...there is absolutely no need for any two models to be the same!”



# RANS S-9 CHAOS

Peter Miller offers up a near 1/5th scale model of an impressively aerobatic Group A home built light aircraft

words & photos » Peter Miller

I had been searching for a new model to design but was suffering from 'designer's block'. I had even built a couple of kits for something to do but kept thinking, 'I wouldn't have done it that way!' and feeling totally dissatisfied.

Then I had an idea. I made a Google search for 'aerobatic aircraft' and found the RANS S-9 Chaos, an amazing kit plane stressed to +9 and -6 G for aerobatics. This aircraft was not a one off but an extremely popular home-built aeroplane. It had many advantages; it was built like a model and came in a huge variety of colour schemes.

Like most home-built aircraft the builders had added their own variations. There were different undercarriages, a choice of spats or plain wheels, and with or without fairings. The rear turtle deck could be stringered or from rolled sheet and it could be built high or low.

The power unit was normally a Rotax engine with a big silencer stuck out on the right side of the fuselage, but some cowlings seemed to indicate a flat four engine.

Let's put it this way, there is absolutely no need for any two models to be the same!

I chose a model with a fairly basic colour scheme and was able to find the owner's email



*Peter with his Chaos, which he rates right up at the top of his favourites list.*





*The RANS S-9 makes another smooth take-off.*



*She's not super scale, but enough so to make it interesting.*

address and get some photos showing the top of the wings and tail. This aircraft had leg fairings but no spats - I hate making spats! I was also able to download the factory three-views and the model follows these closely.

I chose to make the model about 1/5th scale, which gave a wingspan of 54". Discussions with George at 4-Max confirmed that my favourite combination of a 3541 1070 brushless motor, a 40-amp ESC and a 3S 3000mAh LiPo would be the right power set up. Everything clicked.

So here we have a model that looks great and is pretty easy to build. It weighs 3 lbs 13 ounces ready to fly. Now all that matters is how well it flies...

### PROOF OF THE PUDDING

The forecast promised that the front would clear by lunchtime and it did! The wind was light, so let's go.

I moved right out into the middle of our big square field and lined the model up into wind. I opened the throttle. The model took off in a dead straight line and perfectly smoothly. A couple of clicks of up trim and that was it. I can honestly say that in that brief moment I knew I had a winner.

I started doing smooth graceful aerobatics while still in low rates and I had total confidence in the model. Then I went to high rates and the model could be tied into knots, but it never tried to bite. Release the sticks and it was back to normal smooth flight. I always try spin recovery. It is instant and the stall is a non event.

Like the take-off, the landing was perfect - a smooth approach, a gentle touch down and long roll-out. I tell you, it made me look good!

Stuart Picket, who flies my models for the camera, was equally impressed with it and one club member instantly said, "I'm going to build one!" I can honestly say that this is one of the nicest, best behaved models that I have flown in a very long time - and I have quite a few favourites in my stable!

### BUILDING NOTES

The basic construction follows all my normal methods but there are a few that are slightly different. Nothing to get worried about, just read these notes.



*Peter has at least one clubmate who is waiting for the plan to be published. Why not join him and build your own?*



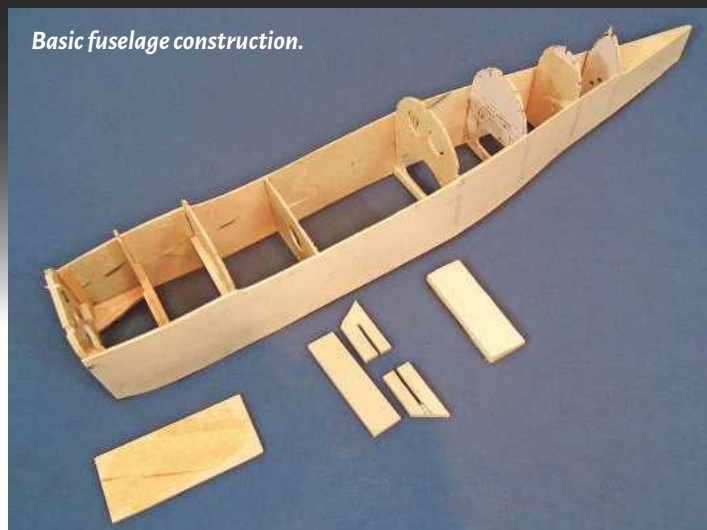
*Being a home built there's absolutely no need for any two models to be the same!*

There are so many variants, but these are really cosmetic. For example, you may decide to use the raised rear turtle deck. This would mean modifying the rear formers. Not a big job but probably best done on the old cut and try system after making the ones on the plan taller.

The undercarriage could be a sheet aluminium type, which would need some minor adaption of the mount.

The canopy is made from 1/2 mm plastic sheet (SLEC can supply a big sheet). The frames are described and work well. You will need to screw the plastic down with 1.6 x 6mm screws. If that worries you then there is an open cockpit version and one with a bubble canopy. Take the time to look through all the Google images before you start building to choose your own favourite.





*Basic fuselage construction.*



*Undercarriage mounting detail.*

“...keyhole slots hold the cowl firmly but allow it to be removed easily”

### BUILDING THE FUSELAGE

The fuselage uses my standard 3/32" sides with 1/3" doublers. Glue the doublers to the sides with Thixofix. Cut out all the formers and add the cross braces as shown. Lay one side down and glue on F-2, F-3, F-4 and F-5. Once these have dried glue on the other side. Then pull the rear in and glue in the rear formers. Adjust the spacing so the rear sides are straight (I ended up with a slight wasp waist). Add the tailplane platform.

This sequence is so that the fuselage will remain straight when gluing in F-1. This is the only tricky bit of the fuselage. You will need a couple of large and strong G-clamps to pull the sides in to the former. Leave to dry and then add the triangular wood in the corners.

Add the supports for the battery platform and glue down the platform. This is designed to take a 3000mAh 3S battery. If fitting a 4S it can be dropped a little but never forget this is a home build, not an Extra, and the power train specified is just about perfect.

Fit the undercarriage mounts as shown. This system is one of the strongest I have ever come across.

Also, fit the ply plate that takes the wing bolt head. The thick balsa sheet on top of it gives a lot of extra gluing area so don't omit that. I use a 1/4" UNC socket head nylon bolt to hold the wing on; Modelfixings can supply these with T-nuts. You will also need a long Allen key to tighten it up, which is done through the hole in the bottom of the fuselage. This also doubles as a cooling outlet hole.

At the front of the fuselage fit the 1/4" square supports and glue on the rolled 3/32" balsa sheet. The battery hatch is a simple flat one of 3/32" sheet over a 1/4" square frame.

Fit the stringers to the rear formers. The top one is 1/4" square, the rest are 1/4" x 1/8". You may need to adjust the slots to get them straight. Add the rolled sheet rear turtle deck. Note that on some Chaos' this is cut away to match the rear transparent sheet and some



*Battery platform and nose sheet supports.*



*Battery hatch in place.*



*Underside view of the hatch showing the hold down catch.*



*Rear of the fuselage with stringers and tailplane platform.*



*Building the cowl from 3/8" and 1/2" sheet. Peter added a non-scale intake below the spinner for cooling.*



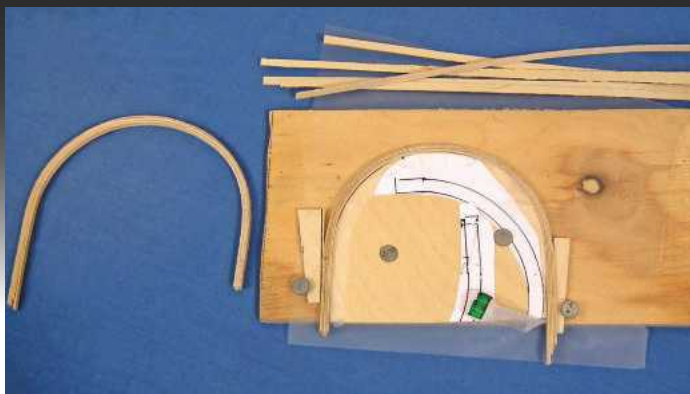
*Rear view of the cowl showing the keyhole slots that hold it in place and which also allow for easy removal.*











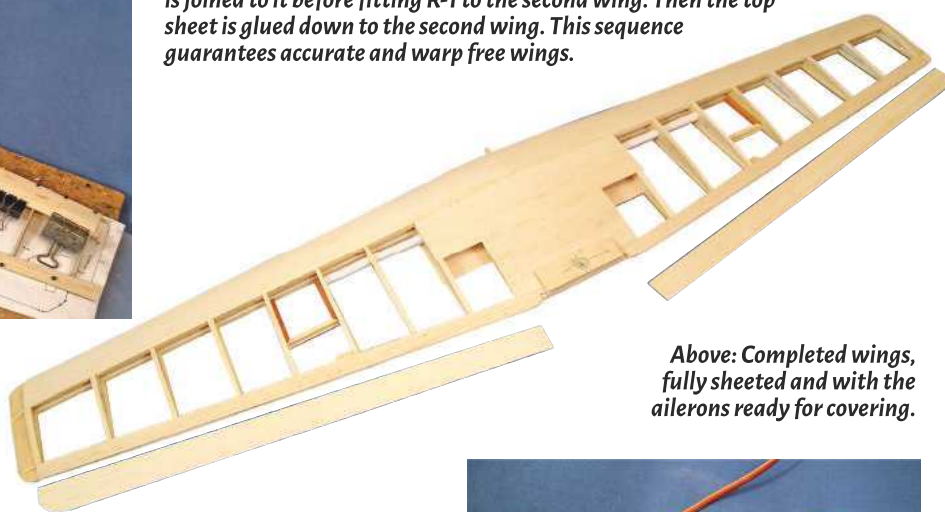
**Making the canopy frames from laminated 1/32" ply. Four frames are needed.**



**Basic wing structure pinned down. Note the strut attachment points.**



**Left: The second wing is pinned down and the complete first wing is joined to it before fitting R-1 to the second wing. Then the top sheet is glued down to the second wing. This sequence guarantees accurate and warp free wings.**



**Above: Completed wings, fully sheathed and with the ailerons ready for covering.**

are not. Install the snakes in the rear fuselage and then you can add the 1/16" bottom sheet with the grain across the fuselage.

The cowl is built onto the rear cowl former. This is held to F-1 with small round head screws in F-1. The keyhole slots hold the cowl firmly but allow it to be removed easily by lifting about a 1/4" and it will come off forwards. A small pivoted catch under the nose holds it down.

Note that the cowls vary. The aircraft that I chose has a hole around the spinner. The Rotax normally fitted is water cooled; at the last minute I made an extra intake under the spinner to make sure that the ESC and battery got extra cooling.

## THE CANOPY

I was going to cut the canopy frames from 1/8" ply but when I had cut out the rear one, I realised that they would be a bit weak. I then used the piece that I had cut out and laminated six strips of 1/32" ply round it. The outer grain of the ply should run along the length of the strips. I made four of these; they are all the same and can be cut to length. Chamfer the tops of the rearmost one and the one at the rear of the front section of the canopy.

Then cut strips of lite-ply, 1/4" wide, to sit on top of the wing centre section. This will be glued on later with the frames so that the plastic canopy can be screwed down onto it.

The canopy is built up after covering. Fit the rear frame to F-5 and then, with the wing bolted down, add the remaining two. The rear one to match the frame on F-5 and the front one is adjusted so that the top of the canopy is parallel to the datum line.

Once the glue has dried and the inside has been painted black you can fit the plastic. First step is to make patterns with stiff paper. I

actually used some thin clear plastic, but stiff paper will be fine. Your big sheet of clear plastic will have a natural curve so use that! Cut out the rear piece and make sure it fits, then drill a 1mm hole through it into the frame, right at top dead centre. Once you are happy with the fit put two more screws into the bottom corners and a couple round the rear.

The middle section of the canopy needs to be fitted to the frames and wing before screwing down. The front section is a bit of a pig to get the shape right, but it can be done. Again, the same technique is used.

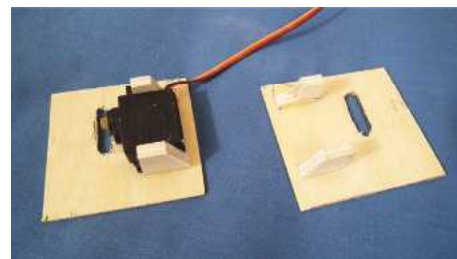
I did add canopy glue just before screwing each section down. I can't say that all this was easy, but it really is worth the effort.

## THE WINGS

The wings follow my standard methods, which guarantee a flat wing and a perfect fit at the root. Note that the second wing has a slightly different sequence, so make sure you read that part now!

Start off by laying down the lower leading edge sheet and the trailing edge capstrip. Add the lower main spar and the 1/2" x 1/8" trailing edge. This trailing edge must be tapered from 1/8" down to 1/16" so that the final complete trailing edge is 3/16" thick when the top capstrip is added.

Glue on the ribs from R1 outwards; R-1 and R-1a must be laminated before assembly. Then glue on the 1/8" sheet leading edge and the top



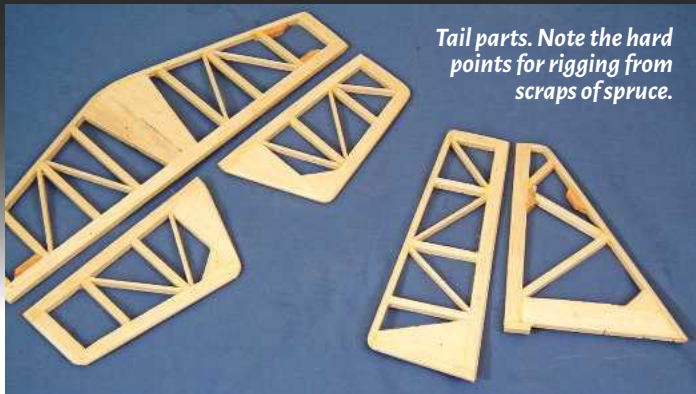
**Wing servo mounts.**



**Lite-ply strips take the screws holding down the plastic canopy. Note the marks where they are to be cut away for the canopy frames.**

trailing edge cap strip. Fit the 1/2" paper tube for the servo lead. When all this has dried raise the lower leading edge sheet and glue to the leading edge. I use Deluxe Materials Superphatic for these joints as it wicks in round the ribs and





Tail parts. Note the hard points for rigging from scraps of spruce.



Right: Underside view showing the non-functional struts, which are easy to fit at the field.



Dummy silencer ready for finishing.

leading edge. Also, add the webs to the front of the spar; if you put them behind the spar you will wish that you hadn't!

Glue in the hard points for the strut attachments. You can now glue on the top leading edge sheet. I use clamps to hold the sheet to the spar and map pins to hold the leading edge sheet to the leading edge.



At this stage the fin covering is only stuck to the edges and left loose.



Fin covering after shrinking. This method works for many aircraft such as Piper Cubs etc.

The second wing is built in the same way BUT do not glue on R-1 or the leading edge sheet yet. With the second wing built to this stage without R-1 and its leading edge sheet, bring the first wing up to it and prop the tip up by 1". This will give you a wing that is flat on top and with 1/2" dihedral under each tip.

With the wings mated, glue in the second R-1. Note that the slot in the R-1s now form the hole for the dowel in the leading edge. Glue the two wings together and complete the second wing with all its top sheeting etc. Add the dihedral brace on top. The wings can now be lifted from the board. Add the bottom dihedral brace.

Now you only have the centre section sheet and capstrips to add. The servo mounts will need 1/4" sq. spruce rails glued into the servo bay. The wing tips can be added. The ply plate for the T-nut is fitted over a piece of balsa so that it is parallel to the bolt plate under the wing.

The ailerons are shaped from 3/16" sheet. Round off the front or shape it to a vee. Taper the aileron from 3/16" down to 1/8" at the trailing edge - this is the scale section.

The centre section sheet is scale and represents the two wing root fuel tanks. You can add the lite-ply strips that will hold the canopy edges or leave this until later. The servo mounts are made from 1/16" ply and short pieces of 1/4" x 1/2" spruce and they are held in with four small screws.

The wings are now complete.

### TAIL FEATHERS

The tail feathers are very simple and built as shown. Use medium to soft wood. Hard points for rigging are scraps of spruce. The rigging is not really essential, but I like it as it will protect the tail from damage in the event of a tumble.

Hinging is done with flocked Mylar CA hinges and the elevators are joined with a 14 SWG wire joiner.

Once the fuselage is complete the tail can be fitted. Glue the tailplane on and leave to dry. Glue on the fin, making sure that it is vertical. The top 1/4" sq. stringer must be trimmed to fit the leading edge of the fin.

Also glue on 1/4" triangular supports at the base of the fin. These support the fin, which

otherwise would be a simple butt joint and far too weak. Now take 1/4" strips and glue these to the tailplane so that they line up with the fuselage sides. These are to take the bottom of the fin covering. I will deal with this in the covering section as it is a special technique.

### FIDDLY BITS

The full-size aircraft has wings struts, two on each side. Although not functional on the model they are very noticeable in flight. Struts can be fiddly when assembling the model on the field, so I have made them as simple as possible.

Take 1/2" x 1/4" spruce and shape it to an airfoil section. A disc sander in a power drill will do this in a minute or two, followed by a bit of fine sanding. Fit the aluminium mounts to the fuselage and wing. These mounts are simply aluminium, about 1/32" thick, bent at right angles with a 2mm hole drilled in each angle.

Take four brass threaded pieces, 1" long (available from SLEC) and screw on small nylon clevises. Drill 2mm holes in the end of the struts and epoxy the brass rods into the strut. Now take four short threaded rods and bend a joggle just at the end of the threaded section.

Trim the struts to length and drill 2mm holes in the other end. Now, with the clevis fixed to the fuselage strut mount, apply epoxy to the thread and slide it into the end of the strut so that the joggle will line up with the wing strut mount. Any fine adjustment can be done on the clevis end of the strut. Mark each strut with its location because if you can get everyone to fit in any location you are a better builder than I am!

The Rotax engines use a large silencer on the right side. This is simply made from a piece of plywood, with balsa added to make the shape. The size is 1" in diameter for the main chamber; the 'pipe' from the silencer to the cowl is 1/2" diameter.

If modelling a version with a flat four engine there is no silencer.

### COVERING THE MODEL

Covering the Chaos is pretty simple but there is one area that does call for a bit of extra care and this is the fin. Look at most fabric covered aircraft and you will see that the covering is not





*This particular aircraft had leg fairings but no spats. Perfect if you hate making spats!*

stuck to every part of the fin. In fact, it stands clear of most of the fin.

Take a piece of covering roughly the shape of the fin but quite a bit larger; especially leave extra extending over the turtle deck stringers. Iron the bottom to that strip of 1/4" square on the top of the tail plane. Next, pull it loosely up to the top stringer and iron it there, and to the fin leading edge and trailing edge. Do not try and pull it tight down at the base of the fin. Repeat for the other side of the fin. Now hit it with a heat gun if possible, if not use an iron. The covering will shrink to a perfect shape, blending the fuselage and tailplane into the fin.

The rest of the model is covered in the normal way. I am sure that we shall see some really spectacular schemes.

#### INSTALLATION

Starting at the front, the motor used is a 4-Max 3541 1070 with a 40-amp ESC, fitted with an APC Slim 11 x 5.5 prop. The battery is a 3S 3000 mAh pack. This set up provides 376 watts, which is perfect.

And before you ask, there is NO down thrust and NO side thrust.

I used 4-Max-4M-175DGM servos, which give three kilos of thrust, probably more than is needed but those are big ailerons. There is more than enough room in the fuselage for any servo.

I used SLEC Heavy Duty snakes, which are nice and stiff and allow you to screw threaded rods into the ends.

Control throws are:

- Ailerons - high rates 1/2" each way, low rates 1/4" each way.
- Elevators - high rates 3/4" each way, low rates 1/2" each way.
- Rudder - high rates 1.1/4" each way, low rates 3/4" each way.

With this set up the model is responsive and smoothly aerobatic on low rates and very aerobatic on high rates.

Centre of Gravity (balance point) is 2.3/4" (70mm) back from the leading edge at the root. At this position the Chaos is very stable and does not want to stall. Spin recovery is instant.

So, there you have it. I like this model and it is right up at the top of my favourites list. ✈



*You can perform smooth, graceful aerobatics while still in low rates.*



*On high rates the Chaos can be tied into knots, but it never tries to bite.*

**"I am sure that we shall see some really spectacular schemes"**



*Before you ask, there is no need for any down or side thrust.*

## DATAFILE

|                      |                                      |
|----------------------|--------------------------------------|
| <b>Model Name:</b>   | RANS S-9 Chaos                       |
| <b>Type:</b>         | Sports scale                         |
| <b>Designed by:</b>  | Peter Miller                         |
| <b>Span:</b>         | 54" (1372mm)                         |
| <b>Wing Area:</b>    | 500 sq.in. (0.323 sq.m.)             |
| <b>Weight:</b>       | 61 ozs (1729g)                       |
| <b>Wing loading:</b> | 17.5 ozs per sq. ft.                 |
| <b>Motor:</b>        | 4-Max 3541 1070                      |
| <b>ESC:</b>          | 40A                                  |
| <b>LiPo:</b>         | 3S 3000 mAh                          |
| <b>Propeller:</b>    | 11" x 5.5"                           |
| <b>Controls:</b>     | Ailerons, elevator, rudder, throttle |



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The 50mm FMS fans are those as used in the Tony Nijhuis "Mini Jet" series, as recently published in the RCM&E.

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| 50mm     | PowerFun 4900kv (3S LiPo - 318W)  | 605g   | £29.99 |
| 50mm     | FMS 5400kv (3S LiPo - 358W)       | 620g   | £38.50 |
| 50mm     | PowerFun 4430kv (4S LiPo - 458W)  | 765g   | £29.99 |
| 50mm     | FMS 4500kv (4S LiPo - 486W)       | 1,086g | £38.50 |
| 64mm     | PowerFun 3900kv (3S LiPo - 434W)  | 872g   | £32.99 |
| 64mm     | PowerFun 3500kv (4S LiPo - 541W)  | 1,072g | £32.99 |
| 70mm     | FMS 2750kv (4S LiPo - 740W)       | 1,253g | £64.99 |
| 70mm     | PowerFun 3400kv (4S LiPo - 776W)  | 1,435g | £39.99 |
| 70mm     | PowerFun 2300kv (6S LiPo - 1148W) | 1,816g | £39.99 |
| 90mm     | PowerFun 1450kv (6S LiPo - 1561W) | 2,924g | £79.99 |
| 90mm     | PowerFun 1100kv (8S LiPo - 1528W) | 3,360g | £79.99 |



## Complete Electrical Setup For RANS S-9 Chaos by Peter Miller

Please visit <http://www.4-max.co.uk/pm-rans-s9-chaos.html>



| Part No.         | Description                           | RRP    |
|------------------|---------------------------------------|--------|
| PO-3541-1070     | 35mm Brushless Outrunner Motor        | £33.49 |
| 4M-ESC40A        | 40A Brushless ESC + Programming Card  | £38.45 |
| APCE 11x5.5      | APC Electric 11" x 5.5" Prop          | £4.30  |
| 4x 4M-100AMG-022 | 4x 10g Digital Metal Gear Servo 2.2Kg | £19.96 |
| PPL-40C3S-2200   | 11.1, 40C, 3S, 2200mAh LiPo Battery   | £22.50 |

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| PPL-25C2S-0350 | 25C/50C, 2S (7.4V) 350mAh   | £3.83   |
| PPL-25C2S-0450 | 25C/50C, 2S (7.4V) 450mAh   | £4.42   |
| PPL-40C2S-0800 | 40C/80C, 2S (7.4V) 800mAh   | £7.42   |
| PPL-40C2S-1000 | 40C/80C, 2S (7.4V) 1000mAh  | £8.97   |
| PPL-40C2S-1300 | 40C/80C, 2S (7.4V) 1300mAh  | £10.67  |
| PPL-40C2S-1800 | 40C/80C, 2S (7.4V) 1800mAh  | £14.23  |
| PPL-40C2S-2200 | 40C/80C, 2S (7.4V) 2200mAh  | £16.13  |
| PPL-40C2S-2600 | 40C/80C, 2S (7.4V) 2600mAh  | £19.45  |
| PPL-40C2S-3300 | 40C/80C, 2S (7.4V) 3300mAh  | £24.60  |
| PPL-25C3S-0350 | 25C/50C, 3S (11.1V) 350mAh  | £5.70   |
| PPL-25C3S-0450 | 25C/50C, 3S (11.1V) 450mAh  | £6.59   |
| PPL-40C3S-0800 | 40C/80C, 3S (11.1V) 800mAh  | £10.57  |
| PPL-40C3S-1000 | 40C/80C, 3S (11.1V) 1000mAh | £13.20  |
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| PPL-40C3S-1800 | 40C/80C, 3S (11.1V) 1800mAh | £21.10  |
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| PPL-40C3S-2600 | 40C/80C, 3S (11.1V) 2600mAh | £28.77  |
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| PPL-40C3S-6000 | 40C/80C, 3S (11.1V) 6000mAh | £67.49  |
| PPL-40C4S-1800 | 40C/80C, 4S (14.8V) 1800mAh | £28.14  |
| PPL-40C4S-2200 | 40C/80C, 4S (14.8V) 2200mAh | £31.49  |
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| PPL-40C4S-3300 | 40C/80C, 4S (14.8V) 3300mAh | £46.80  |
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| PPL-40C4S-5000 | 40C/80C, 4S (14.8V) 5000mAh | £74.79  |
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| PP-PDRV40-50 | For 4.0mm shafts  | £2.95 |
| PP-PDRV50-60 | For 5.0mm shafts  | £3.95 |
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| PP-TEESC90HVAU  | 90A, Burst 100A, OPTO, 5-12 LiPo       | £89.99 |
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| PO-3535 | 870kv, 1090kv, 1390kv                         | £28.99 |
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|    | 4M-056DHVMG-009<br>(High Voltage) | Digital Metal Geared<br>Only 8mm Thick - 5.6g                         | 0.90Kg @ 4.8V - 0.14sec/60°<br>1.05Kg @ 6.0V - 0.12sec/60°<br>1.20Kg @ 7.4V - 0.10sec/60° | 1pcs £8.99ea<br>5pcs £8.09ea   |
|    | 4M-094DMGB-014                    | Digital Metal Geared<br>Ballraced Wing Servo<br>Only 8mm Thick - 9.4g | 1.4Kg @ 4.8V - 0.12sec/60°<br>1.9Kg @ 6.0V - 0.10sec/60°                                  | 1pcs £10.99ea<br>5pcs £9.89ea  |
|    | 4M-090AH-017                      | Micro Analog<br>9g                                                    | 1.7Kg @ 4.8V - 0.09sec/60°<br>1.9Kg @ 6.0V - 0.07sec/60°                                  | 1pcs £2.69ea<br>5pcs £2.42ea   |
|    | 4M-100AMG-022                     | Micro Analog Metal<br>Geared - 10g                                    | 2.2Kg @ 4.8V - 0.12sec/60°<br>2.5Kg @ 6.0V - 0.10sec/60°                                  | 1pcs £4.99ea<br>5pcs £4.49ea   |
|    | 4M-100DMG-022                     | Micro Digital Metal<br>Geared - 10g                                   | 2.2Kg @ 4.8V - 0.12sec/60°<br>2.5Kg @ 6.0V - 0.10sec/60°                                  | 1pcs £6.49ea<br>5pcs £5.84ea   |
|  | 4M-094DHVMG-026<br>(High Voltage) | Digital Metal Geared - 9.4g<br>Ball Raced Only 8mm<br>Thick           | 2.0Kg @ 6.0V - 0.09sec/60°<br>2.6Kg @ 7.4V - 0.07sec/60°                                  | 1pcs £14.99ea<br>5pcs £13.49ea |
|  | 4M-160AH-027                      | Mini Analog<br>16g                                                    | 2.7Kg @ 4.8V - 0.13sec/60°<br>3.0Kg @ 6.0V - 0.11sec/60°                                  | 1pcs £5.99ea<br>5pcs £5.39ea   |
|  | 4M-175DMG-030                     | Mini Digital<br>Metal Geared - 17.5g                                  | 3.0Kg @ 4.8V - 0.13sec/60°<br>3.5Kg @ 6.0V - 0.11sec/60°                                  | 1pcs £7.49ea<br>5pcs £6.74ea   |
|  | 4M-253AB-028                      | Standard/Mini Size<br>Ballraced - 25.3g                               | 2.8Kg @ 4.8V - 0.12sec/60°<br>3.3Kg @ 6.0V - 0.10sec/60°                                  | 1pcs £5.99ea<br>5pcs £5.39ea   |
|  | 4M-410ABH-052                     | Standard Analog<br>Ballraced - 41g                                    | 5.2Kg @ 4.8V - 0.20sec/60°<br>6.5Kg @ 6.0V - 0.16sec/60°                                  | 1pcs £4.50ea<br>5pcs £4.05ea   |
|  | 4M-455AH-033                      | Standard Analog<br>45.5g                                              | 3.3Kg @ 4.8V - 0.15sec/60°<br>4.0Kg @ 6.0V - 0.12sec/60°                                  | 1pcs £6.12ea<br>5pcs £5.51ea   |
|  | 4M-556AMG-087                     | Standard Analog<br>Metal Geared - 55.6g                               | 8.7Kg @ 4.8V - 0.15sec/60°<br>9.4Kg @ 6.0V - 0.13sec/60°                                  | 1pcs £11.99ea<br>5pcs £10.79ea |
|  | 4M-556DMG-087                     | Standard Digital<br>Metal Geared - 55.6g                              | 8.7Kg @ 4.8V - 0.15sec/60°<br>9.4Kg @ 6.0V - 0.13sec/60°                                  | 1pcs £14.99ea<br>5pcs £13.49ea |
|  | 4M-620DHVMG-112<br>(High Voltage) | Digital HV Metal Geared<br>Dual Ball Raced 62g                        | 9.35Kg @ 6.0V - 0.15sec/60°<br>11.2Kg @ 7.4V - 0.13sec/60°                                | 1pcs £17.99ea<br>5pcs £16.19ea |
|  | 4M-556AMG-118                     | Standard Analog<br>Metal Geared - 55.6g                               | 11.8Kg @ 4.8V - 0.20sec/60°<br>13.2Kg @ 6.0V - 0.18sec/60°                                | 1pcs £13.99ea<br>5pcs £12.59ea |
|  | 4M-556DMG-173                     | Standard Digital<br>Metal Geared - 55.6g                              | 17.3Kg @ 4.8V - 0.18sec/60°<br>20.4Kg @ 6.0V - 0.16sec/60°                                | 1pcs £16.99ea<br>5pcs £15.29ea |

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# INVADER MAXIMUS

Shaun Garrity takes a close look at a jumbo version of a Keil Kraft favourite

words & photos » Shaun Garrity

**I**f our annual Pontefract Single Channel and Retro Fly-In had happened, then this was definitely a model I would have featured in my meeting report. To coin a phrase popularised by a fellow RCM&E contributor, this is pure 'Modelling Magic'.

Lockdown over I had a catch-up at the patch with builder and fellow club member Colin Baxter, who is an artisan when it comes to the sticks and tissue genre of aircraft. I'll let him explain why he wanted to build a double sized version of the classic Keil Kraft Invader glider:

"It's quite simple really; a certain Mr Garrity somehow seems to expect (actually it's an implied demand, Colin - Shaun) that I should always build something a bit odd for each Pontefract S/C and Retro Fly in! This coupled with the fact that I had one as a lad, and the choice was made. I would have been about twelve, possibly thirteen I suppose, and being a mere whippersnapper this would have been the early seventies.

My elder brother was given the Invader kit one Christmas. He built the fuselage and I think the

empennage, but not the wing. So, the part-built model had languished under his bed for some months before I offered to complete it. I am not sure to what level my skills had risen at this point but it must have been pretty low as I remember the virtually square leading edges and almost no shaping being carried out on the trailing edges, which were laminated from three strips of 1/8" square balsa. The wing and tailplane were covered in yellow Modelspan; the fuselage and fins may have been red - possibly not. Age is a funny thing, isn't it?

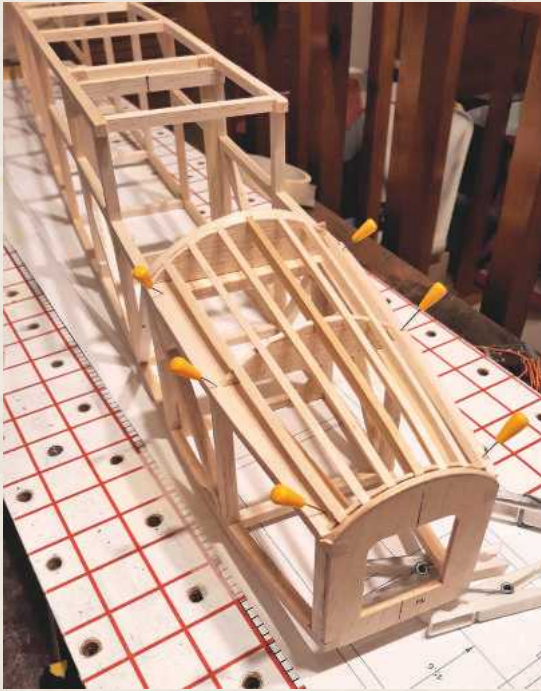
No matter the speculative standard to which it was built, it flew reasonably well, as I remember, and was pretty strong by dint of most strip wood in the kit being 1/8" square. In comparison the similarly sized KK Gypsy's fuselage was made of 3/32" square and that needed to withstand the tension of a Wakefield rubber motor.

I remember one summer's evening the model circling over my head after dropping the towline and I could hear a quiet creaking. After it landed investigation showed that the spars had both

cracked on one wing, allowing the tip dihedral to change by over an inch at will. It had happened in an earlier prang but apparently there was still enough integrity to stand a gentle tow, though it did explain why it suddenly always wanted to veer to the left on tow!

Another reason for building the Big Invader has been the new prevailing attitude that seems to think that the only way to convert an Invader to R/C is by the 'wobbly wing' method, ably demonstrated by John Woodhouse. Impressive though his model is (and his skills and models are far superior to mine) I find the conversion leads to the model flying in a way that I find counter to the essence of an Invader. I know that R/C and electric motors do the same but that's okay for me, and proves what a contrary person I really am. The prevalence of the aforementioned attitude was demonstrated by the fact that during the build, even though I stated several times that I wouldn't be using that method of control, I got quite fatigued by the number of times I was advised on how to affect my non-existent wobbly wing!





Above: Vinyl cutters are a great way to produce graphics for models. Modern vinyl is extremely thin and looks like paint.

Left: Balsa sticks and fresh air make for a light model. Colin's scale-up used the same construction as the original.

### BUILD DETAILS

The plan was traced and enlarged using Draft Sight CAD and as far as possible I scaled up the wood sizes as well because the visible robustness is part of the Invader look.

I have a philosophy about scaling up and before everyone starts writing to their MP or Points of View, or venting their spleen at me based upon the 'double the size is eight times the weight' argument, let me elucidate.

Firstly, double the size is indeed eight times the volume, which if the object in question is the same solid material is eight times the weight. But a model is not solid; it is mostly air. All wood used, which has gone up by the scaling factor, will be eight times the original weight, but the same covering only goes up by four times the weight. Also, the lifting area will increase by a factor of four. Plus, for rubber or power models, doubling the size is unlikely to lead to eight times the power plant weight. Mathematically, if made to the

absolute original design but scaled up times two, the wing loading should only increase by a factor of times two.

For me, this is actually a good thing as I believe the design could take it and it will make it a far more flyable model given the wind conditions in my location upon the globe.

The wings have extra riblets to help to combat covering sag and the lower centre section spar is spruce. All incidences are as per the original plan, with zero down thrust on the motors, though flying has indicated that a couple of degrees may not go amiss. The wing tips are removable one bay in from the dihedral break. This has three advantages:

1. It makes the CF rod and tube wing joiners much easier to fit.
2. It makes it much easier to get equal, accurate and repeatable dihedral on each tip.
3. It enabled the spars in the centre section to be cut from standard 36" strip.



Twin geodetic fins hung off the shallow V-tail are the Invader's signature look.

All my wood for the build came from Balsa Cabin and I couldn't fault the excellent quality. Mylar and Esaki were from Mike at Free Flight Supplies and the graphics were cut from self-adhesive vinyl with my Silhouette Cameo cutter.



Tail mounted servos give direct and slop free linkages.



One of the four motors from the Invader that thinks it's a Lancaster. They provide just enough power.





The man and his model. As Colin notes, 'She's a big lass!'



With the available power the climb out is very sedate but looks absolutely correct.



## FLYING

The small motors make it very much a powered glider, which I feel is in keeping with my view of the spirit of the original design. No loops or inverted for this big lass! Some 1/16" packing has been added under the wing trailing edge to tame the pitch up under power, plus mixing in a little down elevator to throttle. In calm conditions a slow climb to altitude, followed by closing the throttle and nudging it around the sky as it regally ambles about is the order of the day. It is a real reminder of those 'excellent' park flights with my original, which memory tells me were numerous but were in actual fact quite rare as we invariably flew in unsuitable conditions, impatience being a synonym for youth!

## SPECIFICATIONS

**Wingspan:** 80" (i.e. near as makes no difference twice the original)  
**Length:** 49"  
**Tailplane span:** 32"  
**Motors:** D1811 x 4, contra-rotating pairs  
**Props:** APS 6 x 4 EP (2 x RH, 2 x LH)  
**LiPo:** 2S 2200mAh 60C  
**Total input:** circa 125W  
**AUW:** 1010g

## Servos:

4 x Blue Arrow SO2510  
 Ultra-Micro 2.8g  
 (2 elevators, 2 rudders)  
 4 x Red Brick 10A  
 Esaki Liteflite tissue doped  
 over Mylar (some Doculam)

## ESCs:

## Covering:

## HISTORY

The designer of the Invader was Albert E Hatfull - yes, he who later designed the ubiquitous Junior 60. The Invader was in fact A. E. H's first kitted design; as a teenager at Technical College in 1944 he turned up on spec at the gates of KeilKraft and had spoken to Eddie Keil himself, who had said he 'could have a go' at designing a glider, and if he (Eddie) liked it he would kit it - which is exactly what happened. The Invader name came about because it was around the time of the Invasion of Europe in WWII. Its popularity was, and is, unquestionable - it is part of the 'new KeilKraft range' being offered by RipMax around 75 years later. For a potted history about Albert Hatfull and his designs, I point you to Chris Jenkins' thread entitled appropriately Albert Hatfull on RCGroups."

Having seen the Invader fly on a number of occasions, I can confirm it's a truly outstanding model with a magnificent presence in the air. It can't loop, prop hang, fly inverted or perform rolling circles but it doesn't need to because sometimes less is

Being originally a free flight model, Invader will usually land perfectly without any pilot interference.

most definitely more. Occasionally scale up look very wrong; I know from personal experience that an aesthetically pleasing model can turn into an ugly duckling when enlarged but that definitely isn't the case here. I hope Colin's Invader is around for many years, so like-minded modellers can enjoy watching it as well. It's pure Model Magic.

## A POTTED HISTORY OF MODEL MAGS

Back in what is generally considered aviation year dot (1903) when Wilbur and Orville Wright first flew, budding amateur aerodynamicists quickly replicated this feat on a smaller scale with flying models built mainly from spruce and oiled silk. Very little information was available to them, which led to some interesting flying machines in the early days. These modellers were late to the aviation party though.

In 1898 Archaeologists excavating the Egyptian Saqqara burial grounds found an entombed example of what appeared to be a 6" wingspan model aircraft, and don't forget Da Vinci's much later design for a





Meccano magazine occasionally had model aircraft features. Vic Smeed's Cracker was indeed that - a cracking model.



Aeromodeller hit the shelves in 1935 and suddenly Aeromodellers could find all the latest news and developments.



A year after Aeromodeller first published, Model Aeroplane Constructor became available. Modellers were now positively awash with information.



Model Aircraft was promoted as the Official Journal of the S.M.A.E. and was a real competitor to Aeromodeller.

rudimentary helicopter called the Aerial Screw from around 1500.

The earliest reference to an actual flying model that I'm aware of was Frenchman Alphonse Penaud who, in 1871, demonstrated an 18" wingspan rubber-powered model with a feather-bladed pusher propeller. Called the Planophore it flew for 11 seconds and covered 131 feet when flown at the gardens of the Tuileries in Paris.

Aeromodeller didn't hit the news-stands until November 1935. Prior to that the odd model aircraft item would appear in **Meccano Magazine** (first published in 1916). November 1969 was a particularly memorable edition as it featured a great single channel design by Vic Smeed. Called Cracker it could easily be updated to proportional Rudder, Elevator and Throttle when funds allowed. Back on the timeline, a year later in 1936 another magazine hit the streets. Called **The Model Aeroplane Constructor** and pitched as 'The Premier Journal in Model Aeronautics in England' (I'm confident Aeromodeller would

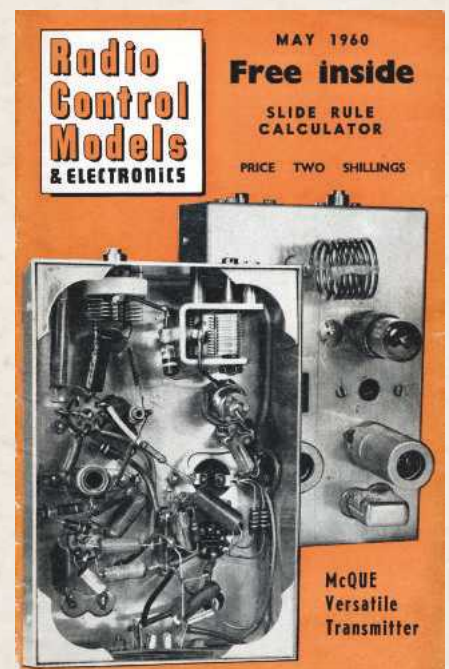
have vehemently contested that claim) its content was a country mile from what we get today. It was about as much fun as watching paint dry (my opinion, before I get shot down in flames) but to be fair there was little to write about back then in these early magazines.

**Le Modèle Réduit d'Avion** was the French equivalent of Aeromodeller and launched just a year later in 1936 and is still going strong many years later. With work I went through a period spending many hours in French airports and it became a favourite read while waiting for delayed planes. Well, I had to make some use of my schoolboy French.

These pioneering modellers generally flew gliders or rubber powered aircraft with just a few delving into IC or compressed air powered models, and you could count on one hand modellers who flew Radio Control. Things were different in the US however; between 1933 and 1940 Bill Brown (who manufactured the Brown Junior) sold over

50,000 spark ignition engines, an exceptional feat. Unfortunately, when import taxes and Sterling/Dollar conversions were applied it made them too expensive for the average UK modeller.

**Model Engineer** was first published in 1898 so I guess this was the patient zero of all hobby magazines. Years after its inaugural edition it occasionally had articles and plans for IC engines (marine and aero) to keep the modelling fraternity happy.



RCM&E - little needs to be said. It was the first dedicated UK publication for R/C modellers and was an instant success.

Promoted as 'The Journal of the Society of Model Aeronautical Engineers' (S.M.A.E. - now known as the BMFA, if you are not familiar) another favourite tome was **Model Aircraft**. First published in January 1942 this magazine was the first real competitor to Aeromodeller and proved a popular read in the UK, covering free flight, control line, the occasional feature on radio control and the frequent inclusion of full-sized plans.

**RCM&E** made its debut in May 1960 and was the first dedicated UK magazine specialising in radio-controlled models. It provided pages of invaluable information for home constructors, often including designs for transmitters and receivers. Unless you were exceptionally well heeled and could buy

**Le Modèle Réduit d'Avion** was France's Aeromodeller and is still available today, I believe.

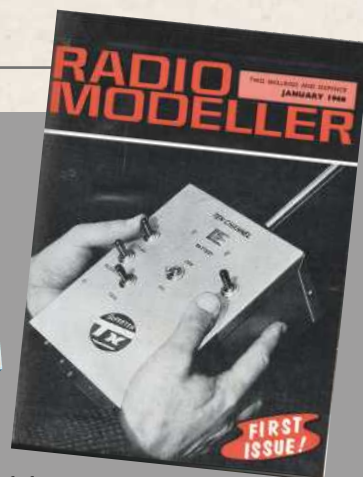




A manufacturer publishing a hobby magazine isn't a great idea. Content was, to be kind, biased. RCS was taken over by Radio Modeller after only six issues.



Above: *Model Review* was a side project from the *Radio Modeller* team and only six issues were published. Right: *Radio Modeller* also had a huge following, especially if you were a glider guider, with regular slope, thermal features and plans.



Yet another short run magazine, *Skyplane* had a very similar look to the later RCMW.

one of the very few and expensive commercial sets this was the popular way for modellers to experience the thrill of R/C flight.

Next on the shelves wasn't *Radio Modeller*. Prior to this another magazine had a short publication run in 1965; called *Radio Controlled Systems* it was produced by the R/C manufacturer RCS. Magazines need advertisers to generate much needed revenue and the problem with this one was an obvious bias, promoting RCS gear at every option. Not a great way to encourage other manufacturers to get involved. I believe only six issues were published before *Radio Modeller* took over and re-launched in January 1966.

In 1969 the team at *Radio Modeller* offered another magazine called *Model Review*. The content covered planes, boats and cars, and it was intended to appeal to a wider range of hobbyists. Six bi-monthly issues later it was another mag that disappeared into the ether. Eventually *Radio Modeller* merged with RCM&E.

Next to tempt us was another publication that didn't last long. *Skyplane* first hit the shelves in May 1982. I'm not

certain but this could have been another mag that changed owners and was re-launched as it had a very similar look to the later January 1984 published *Radio Control Model World*.

Like RCM&E, *RC Model World* was a tremendously popular publication that had a good run but sadly went out of print in 2017. Kevin, our esteemed editor, sat in the big boy's chair there for several years.

At the peak we were spoilt for choice: *Aviation Modeller*, *Radio Control Model Flyer*, *Quiet and Electric Flight International*, *Sailplane & Electric Modeller*, *RC Electric Flyer*, *Silent Flight* and for heli pilots *Radio Helicopter International*, *Radio*

*Controlled Helicopters*, *Radio Controlled Rotor Sport*, to name but a few and all now long gone.

Finally, another favourite of mine from around 1992 was called *Flying Model Designer & Constructor*. Published four times per year by PAMAG it was aimed at traditional Aeromodellers (no foam or ARTF) covering free flight, control line and R/C. Yet another one that bit the dust and I'm sure I've missed many more out - can you remember them?

I hope you've all managed to get back to some socially distanced flying again. I've rekindled a passion for slope soaring during the last three months, reconditioning my Mk1 Phase 6 and I brought a tired old Impala back to life, ready for some



Kevin's baby for a few years. *Radio Control Model World* sadly went out of production in 2017.

single channel retro fun, guided with retro radios recently converted to 2.4Ghz. More details next time. ✈️

*Flying Model Designer and Constructor* was published 'Up North' in Sheffield. Around for a number of years, it too had its fans and covered a range of topics.





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CARF Models DHC CT-144  
flown by Rinus Pretorius.  
JetCat 160 SE power.

# ELVINGTON MODEL FLYERS

Whittaker crosses The Pennines to kick the tyres and light the fires

words & photos » Alex Whittaker

**I**n the ill-fated model flying summer of 2020, that almost never was, what was this? An actual calendar date, at last! I was in the auld two-seater and blasting over The Pennines before you could say "Baht 'at". Aye lad, I were driving over'tut Yorkshire. Where men are men - and tha' allus pays for thine own pint, thysen. (*I won't even try to edit that!* - KC)

**"Everything was quietly and safely regulated"**

## SOCIAL DISTANCING

As regards Social Distancing, the Elvington Model Flyers club took their duty of care very seriously. Everything was quietly and safely regulated, and although not greeting your mates properly seemed very odd, the sun shone, and we had a great day. As you can see from the snaps, I took a 2.7 metre pole to keep the pilots safely away and it worked like a charm.

## ZIROLI TURBINATOR

The first jet I saw was a bit out of the ordinary for a modern jet meeting. She was traditionally built, had no carbon fibre mouldings, and was very distinctive. I scratched my head, and she turned out to be a modified Nic Zirolu Turbinator, owned by Richard Bowler. She was all groovy angles, smooth curves, and had a highly practical turbine position for her Wren 75. True, Richard had rounded the top deck, which I loved. I also loved the bold red and chequer trim.



The season has Started Up!



Social distancing myself at 2.7 metres from Kevin Watson.





*Nic Zirola Turbinator, owned by Richard Bowler. I loved it.*



*Above: Chris Seaman with his Freewing twin EDF Su 57 foamie. 70" in span.*

*Left: Chris Seaman's nicely weathered Philip Avonds F-15. 58" span.*



*Chris' F-15 is powered by these twin Wren 44 gas turbines.*

### **SUKHOI SU 57**

Chris Seaman had a fair few model jets with him but began the day with his Freewing twin EDF Su 57 foamie. This was 70" in span and looked very sleek. Chris is using it as a test bed for his gas turbine version.

### **AVONDS F-15**

Chris was also campaigning his nicely weathered Philip Avonds, 58" span F-15. This looked spectacular on howling, fast approaches. It was powered by twin Wren 44 gas turbines in what I thought was a very tidy installation. You have to be meticulous with jets!

### **YELLOW AIRCRAFT F-15**

You can't have too many F-15s and Jim Ward was flying his, as yet not quite finished, version, though I loved the stripes. This will be completed in the Mad Hatter scheme. The model is built from the Yellow Aircraft kit and spans 70" but is fitted with Jet Munt 100 gas turbine.

*Jim Ward's Yellow Aircraft F-15. 70" span for Jet Munt 100.*







Denis Cleobury and his hand-crafted Vampire. Wren 100 power, 100" span.



Vampire on short finals.



Steve Kendal and his blue and white, 1.4m span, X Choi 45 powered Sebart MB 339.



Rinus Pretorius' immaculate three metre span DHC CT-144.

## DH VAMPIRE

Denis Cleobury was flying his nicely finished Vampire from the Kerry Sterner plan. She is powered by a Wren 100 and spans 100 inches, too. She is built to 1/5th scale and flew superbly. The Vampire always reminds me of the late, great David Boddington. He used to fly the full size. Also, there used to be a Vampire wing tucked away in the bushes at Barton Aerodrome. I used to look at it in wonder when I was there for the control line flying.

## AEROMACCHI MB 339

Steve Kendal flew his blue and white, 1.4 metre span, X Choi 45 powered Sebart MB 339. It was his birthday the night before and Steve was feeling a bit... err... fragile. Nevertheless, the flying cleared his head. Incidentally, I am so used to seeing MB 339s with tip tanks that this Freccie Tricolori display version looked very refreshing. Just so you know for your next Club Quiz, Freccie Tricolori is officially known as the 313° Gruppo Addestramento Acrobatico, Pattuglia Acrobatica Nazionale Freccie Tricolori. In other words, the aerobatic demonstration team of the Italian Air Force. Phew.

## DHC CT-144 TUTOR

This immaculate three metre span CARF Models scale beauty was flown by Rinus Pretorius. She was JetCat 160 SE powered and

really did look the part. Stunning in the air and on the tarmac, she has real presence. Rinus is a cracking pilot. He flew her with all the scale respect she deserved. Everything a scale model jet should be.

## KRILL AVANTS

One of my dear, but old auld mates, Paul Crawshaw, was on the tarmac. It was great to see him after so long a gap. It is a lovely model and, as always, Paul flew very well. We had a good natter about things past in Yorkshire radio modelling. Whenever I am in Yorkshire, I tend to rely upon him and his mates. By the way, his blue and mostly white Avanti S is ace. It is Jet Munt 140 gas turbine powered and spans 2.1 metres.

## DIAMOND

Now this really is something different. A freeform, almost science-fiction shape that takes the breath away, and flies like a dream. Talk about a vivid design statement! This iconoclastic jet could only be an Aviation Designs Diamond. There is literally nothing else remotely like this celebrated design, and I think she looks like a million bucks. Owner, John McNamara flew her very sympathetically and the metallic colour scheme sizzled in the bright summer sun. She spans two metres and is powered by a PBS 20A gas turbine knocking out 220 Newtons. I want one.



Paul Crawshaw's Avanti S. Jet Munt 140 gas turbine power, 2.1m span.

## VULCAN BOMBER

Richard Bowler also flew his Tony Nijhuis Designs 98" span Vulcan. This was a lockdown built, traditionally constructed model. She is powered by a Wren 100 gas turbine. On low passes she emulated the sheer authority of the full-size V Bomber. A fine scale model.

## PST REACTION

Kevin Watson, who claims to be younger than me, flew his trike undercart, 84" span, Jet Cat P 80 powered PST Reaction. This really was to my taste, and I really liked its unusual lines. I appreciated the bright yellow and blue mock US Navy scheme too. It flew very well and had very positive ground handling.





*Left: Hot seat! This guy is sitting on a PBS 20A gas turbine, knocking out 220 Newtons.*

*Below: Aviation Designs Diamond owned by John McNamara. Wow!*



*Richard Bowler with his Tony Nijhuis Designs Vulcan.*



*Kevin Watson's PST Reaction flew well. I liked the model and the scheme.*

### REDWING GRYPHON EVO

My long-time mate, Andy Ellison had primed me about this jet event. Andy has helped me out for years, and most especially when we both worked together on This Great Organ. This time he got me back on the road after months of enforced Lockdown. He finessed an invitation for me to attend this superb Elvington Jet Meeting. Once there, he also offered me lunch and a continuous stream of hot and cold drinks from his smart new modelling van. We had not seen each other for months, but although we regularly chat via social media it was still great to be face-to-face with my old pal. However, I

had to sit near my vehicle and Andy by his, and we had to shout a bit. Odd but safe. We both had gloves and masks.

Anyhow, as usual, Andy was flying a few models, the first being his Redwing Gryphon Evo Jet. Built entirely of composite materials, Andy's Evo is two metres in span, weighs 9 kg and flies on 10lbs thrust. A very interesting constructional concept, and a fine jet model.

### SUPERSPORT HAVOC

However, even this fine EVO was overshadowed by Andy's other jet steed. This was an immaculate, all-moulded Elite Aerosports

Havoc SS. Now this really is a snazzy appliance. She has a wingspan of 2.18 m (85 inches) and weighs in at 35lbs dry. She is powered by a Jet Italia Kaiman gas turbine. This produces 200+ Newton metres of thrust (much more than Andrew, by the way). She is fitted with a Demon Cortex Gyro.

*Right: Andy on the sticks.*



*Andy Ellison's Redwing Gryphon Evo. Two metres in span and weighs just 9 kg.*



*Andy Ellison's Havoc SS really is a snazzy appliance.*



**“All credit to the Elvington Model Flyers for such a safely organised, non-officious and well-run event”**

Now, although I am a bit of a savage myself, I do admire the 'systems' side of modern jet models. I love the autonomous but override-able start-up systems, the fuel and hydraulic lines, the smoke systems, the servo systems, the battery back-ups, and all that clever built in system redundancy. I told Andrew that I thought the pains taking jet installation on the Havoc was, quite frankly, superb. Andy instantly told me that the jet 'install' (ahem) was not down to him. It was performed by Sonny Millgate, through AZ Aerosports.

Incidentally, she uses Savox servos and a Powerbox Smoke System. All in all, she looked pretty state of the art to a punter like me. I really liked the out-of-the-rut colour scheme, too. Andy is an effortless flyer, but the big climb-outs followed by huge jet loops and l-o-n-g slow rolls were a delight to watch. Big model jets really do let you appreciate a well flown aerobatic manoeuvre.

### EXCALIBUR

Colin Parkhouse's 1.85 metre span Excalibur is a very practical, traditionally constructed model jet and a great flyer. Access to the gas turbine is superb! She is powered by a Wren 100. I liked the no-fuss engine access. However, being an intensely shallow person, I was even more delighted when I noticed that Colin had 'coded' his Tx and model. Aye, his yellow model and yellow Multiplex Royal SX 16 transmitter made a fine match. I really must seek professional help...



*The Havoc's 'install' was by Sonny Millgate, through AZ Aerosports.*

### PARITECH DG-303 ACRO

Wow! Richard Bramham stole a march on all the other jet models at Elvington. His mount was an elegant, third-scale, five metre span, fully aerobatic glider. This beautiful model was powered by a Jet Munt 70 gas turbine. A true 'glass ship', as we used to say, and she looked profoundly groovy. What a graceful model, and she had the performance to go with her looks, too. Lovely on a hot summer's day, easily capable of thermalling away and not wanting to come down.

### THE VERDICT

All credit to the Elvington Model Flyers for such a safely organised, non-officious and well-run event. It was life affirming to be back on a busy



*Colin Parkhouse's yellow Excalibur and matching yellow Multiplex Royal SX 16.*

flight line. Flying was continuous, all day. At one point the cheery pits queue was ten jets deep! At two metre spacing that's a long way. All the pilots were sensible. They just obeyed the simple rules, and all was well. Mind you, I suppose such rules will be with us for the foreseeable future.

Elvington is also famous for its full-size light aircraft movements, which add to the joy of any visit. It was great being completely safe, but quite close to the full-size action. Last but not least, it was odd to be using a blue plastic Portaloo on a windy airfield after all these months of lockdown. The season is back on! ✈️



*Richard Bramham and his Paritech DG-303 with Jet Munt 70 power.*

### ACKNOWLEDGMENTS

Thanks to the good offices of Andrew Ellison for wangling me the invitation at very short notice, and of course to the Elvington club for looking after me so well. Ian Lees and John McNamara deserve my special gratitude, but everyone else in their club was very patient with me too.



*I love this wonderfully accessible gas turbine.*



*Elvington is famed for its light aircraft movements. Here's a nifty Sequoia Falco F8L.*





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# JUMBO JUMBO

Who says size doesn't matter! Bruce Corfe checks out a mega-model in sunny Western Australia

words » Bruce Corfe photos » Bruce Corfe & Alex Genovese

## “Andrew claims it is the largest flying model Jumbo Jet in the world!”

**W**hoever said ‘size doesn't matter’ had obviously never heard of Perth modeller, Andrew Herzfeld. Andrew has created, from scratch, not one but two enormous turbine-powered scale model airliners; the one featured here is his awe-inspiring four-engine 747-400 ‘Queen of the Sky’. Andrew claims it is the largest flying model Jumbo Jet (dramatic pause...) *in the World!*

Andrew is a leading light in the modelling scene in Perth, Western Australia, in particular because of his involvement with jets. I'd seen his previous giant-scale jetliner, his A300-200 twin IFR rating, unfortunately directly before the 1989 Australian airline pilots' strike, which crippled the industry. He then worked as a skipper, operating ferries at Perth and Mandurah

He worked in the cray-fishing industry after leaving school before the end of Year 10 and then began training as a commercial pilot. He achieved a commercial pilot twin IFR rating, unfortunately directly before the 1989 Australian airline pilots' strike, which crippled the industry. He then worked as a skipper, operating ferries at Perth and Mandurah



*Pre-social distancing, Andrew (centre) and helpers get up close and personal whilst testing the four ATJ 140 SV turbines. The ‘fish tank’ is full of Jet A1!*





*On pre-flight display at a show at Perth's WAMASC field, the Jumbo dwarfs the pits.*

(80km south of Perth) and then a fishing charter boat in Broome (in the Kimberley region, over 2200km north) and as an earthmoving machine owner/operator, also in Broome.

Building model aircraft has been a passion of his for over 40 years. He became interested in models as a young child living in a two-storey house with a large back lawn overlooking Perth Airport, which saw him launching many paper aircraft and small balsa models off the verandah in his younger years. His first R/C model was an Aeroflyte 'Brolga', a 2m thermal glider, which he launched off the coastal dunes at Quinn's Rocks, north of Perth. A family move to Jurien Bay (200+ km north of Perth, on the Indian Ocean coast – apologies for the geography lesson!) was where Andrew got together with a group of fishermen who flew at the local airfield. The favourite aircraft back then was a Funky 'Skyleader' pattern ship with an OS 60 FSR and a tuned pipe.

Andrew's first introduction to jets was with a Falcon 120 and since then many models have rolled out of Hertz's Hangar, including sports jets, his giant scale A330 and, of course, the Jumbo. The current jet scene in Perth includes 'WestJet', which Andrew has been involved with for many years, both as events officer and Club President. WestJet has a membership of around 30. They fly at local fields and have Civil Aviation Safety Authority (C.A.S.A.) approval to operate at two full-sized airfields in Western Australia, at Wagin and Wongan Hills, both of which are several hours' drive from Perth.

His reason for deciding to tackle the 747 was that he's always been fascinated with the sheer size of the Jumbo and so he decided to set out to bring something unique to the jet scene in Perth.



*A close-up of the finish and detail on the model. Andrew chose Boeing's own promotional livery.*

## CONSTRUCTION

The plans were drawn from a scaled-down version of the full-size aircraft's plans. Profiles were drawn to enable cutting of the shapes from polystyrene foam. The foam was hand cut from plywood profile templates using a hot wire. In total there were 28 separate core sections, which were then joined together to complete the core. The core was then sheeted with 2mm balsa, sanded smooth and then layered with light fibreglass cloth and epoxy resin. Carbon fibre was used to strengthen the core where required.

The engines used are four ATJ 140 SVs, with onboard computer systems and a combined thrust of 56 kgs. Each engine is mounted on a carbon fibre mount joined to the two spars that run the full length of the wing. 20 litres of Jet A1 fuel give a flight time of 10 minutes. All the electronics, fuel pumps and FADECs (Full Authority Digital Engine Controls) are located close to each engine in the wing.

The electronics installation is complex. In total there are 74 electronic components, including 22 servos, five electric retract units, two retract controllers, brakes and navigation lights, with nine 6000mAh batteries, four of each of the turbine components, plus a great many adaptors, converters and switches. The retract system comprises eight servo driven gear doors and five electric retract units. It requires the use of two



*The 16 wheels of the main mid-section undercarriage.*



*One of the four engine nacelles, with lots of space round the ATJ 140 should a bigger unit be required!*

programmable control units and the gear system in the JR 28X transmitter, all working together to enable the systems to work. The control system utilises the JR Xbus system.

The engine nacelles were made by hand-cutting foam to the required shape using three sections. A ply profile was placed on the ends and the centre was removed using a hot wire. Once happy with the shape it was layered up with glass and epoxy resin. Engine mounts were made using a foam core, plus carbon and epoxy, with 10mm ply layered in to form the mounts. All control surfaces were constructed using the same method of balsa and glass over foam. All were hand-cut using a hot wire. Control horns were hand-cut from 2mm fibreglass sheet.





Looming front section of the 747.

## “In total there are 74 electronic components, including 22 servos”

The undercarriage was turned up from aluminium. There was a lot of mathematics involved here to be sure that the legs were the correct length, to ensure that the model sat at the correct angle on the ground and gave enough ground clearance for the engine nacelles. Each leg is individually sprung.

### PAINTING & DETAILING

Andrew says:

*“Once the fuselage, fin and three wing sections were sheeted with 2mm balsa they were covered with light cloth and epoxy resin. The process involved using a peel ply to create a smooth finish.*

*Painting was an experience in itself. I chose the original Boeing promotional colours, as my favourite colour is blue and I didn't want to represent any particular airline's scheme. I obtained all the right gear and a lot of advice from a friend who works for a local paint supplier (Boris Dropulic, S+S Industries, Perth). Not having completed a spray-painting job before, the advice I was given was very valuable. The process took a solid 32 hours and was completed in one sitting, all done in a makeshift spray booth in my backyard shed. As a first timer spray painter the end result was pretty close to what I had envisaged.*



Andrew, assisted by son Nelson, uses the P.A. to describe the Jumbo to the Whiteman Park model show crowd.

*The decals were a masterpiece in themselves and were created by great friends in the hobby, Lori and Rod O'Neil. They were applied using a laser to ensure that they were straight”.*

### FINALLY THERE!

Andrew's son, Nelson helped during the build and was his biggest 'quality controller' throughout! Weighing in at 65kgs the model is 5.6m in length, has a wingspan of 5.2m and is constructed from polystyrene foam, balsa wood and fibreglass. The model is transported in a home-built custom-made trailer. The wings are removable to allow for ease of transport.

The certification process involved many cups of coffee during the build process with local Giant Model inspector Ken Greaves. In line with the Model Aircraft Association of Australia procedures the model was inspected at every stage throughout the build.

The location of Wagin Airfield was chosen as the best place to commit to a maiden voyage and after obtaining the necessary CASA approvals, two attempts were made (foiled by bad weather) before the world's largest RC Jumbo Jet finally flew on the 19th May 2018.

After two years of construction and much



The four electronic components at the top are the data terminals providing engine information, enabling adjustments to be made to start-up and running. The bank of LiPo batteries are at the bottom.

red tape the model finally took to the skies over Wagin Airfield. Although every calculation and a rigorous inspection process had taken place, the first flight of the model was a nerve-wracking experience and one which could have seen the aircraft end in a huge fireball on the runway! It was with huge relief and loud cheers from the many onlookers that the aircraft took off perfectly and completed a seven-minute flight before it was time to complete the most important part of any flight, the landing. Having had only seven minutes to get the feel of the aircraft, Andrew's instinct took over and he landed the aircraft safely. The 747 has since completed many flights and, having been certified to the requirements of the MAAA, is now allowed to fly for public display.

### 747 IN ACTION

Back to Andrew:

*“After successfully building my four metre A330 twin turbine (100n) airliner and subsequently having enjoyed many enjoyable and challenging flights, I acquired the plans to build the giant scale Jumbo Jet. Many weeks were spent simply looking at the plans and making decisions on how things*



Ear defenders on! Taxiing the jet on its public premiere.





**At last! Ken Greaves, Giant Model inspector, who conducted the inspection process during the build, hands over the Jumbo's certificate after the third certification flight. (Alex Genovese)**

were to be done, checking numbers, how to go about building the aircraft and making it into a flying replica of the Queen of the Sky.

The first block of polystyrene foam was purchased in January 2016 and the hot wire cutting began once the profiles were made, from computer generated images. Over a week later I was able to assemble the cut pieces and begin to see the aircraft taking shape. The nose section was hand-carved from outlines off the plan.

All the parts for the aircraft were hand cut. One of the many challenges of building this aircraft was the undercarriage, to enable the five legs to operate in sequence along with the eight gear doors.

A dream became a reality when I was offered the opportunity to take the model to Perth Airport and place it alongside a real Qantas 747 400. The 747 400 'Queen of the Sky' has always held my fascination and, on many occasions, I have been overawed by the sheer size of the aircraft and how it is possible for 360 tonnes of metal to be able to fly. To be able to place my model alongside the real deal and have the opportunity to show my model to the crew of the Qantas jet was an amazing experience. To add to the experience, I was fortunate enough to be allowed to view the cockpit and sit in the captain's seat. The crew were fascinated by my aircraft, congratulated me on my work and were very curious to know the technical details of the model.

Having lived through traumatic events throughout my life - serious illness and other issues - having a passion for model aircraft has helped me along the way to be not just a survivor, but a thriver. I am the president of WestJet, which is W.A.'s model jet aircraft association. We fly at the Western Australian Model Aircraft State Centre, (WAMASC) at Whiteman Park, Perth, the Kalamunda Aero Modellers Society, (KAMS), south of Perth, and Wagin Airfield, where we have secured a five-year C.A.S.A. approval to fly R/C models. Wagin is currently the only airfield at which the 747 can be flown because of the size of the aircraft.

Flying? After the nerves of the first few flights, flying the giant-sized model is much the same as any other model. However, it does use a lot more of the sky and muscles are a little more tense knowing that there is a whole lot more that can go wrong. Four miniature turbines, 74 electronic components, 54 amps-worth of batteries and 20 litres of Jet A1, all encased in a polystyrene foam tube and all relying on a single 0.032mm copper wire - what could possibly go wrong?! Many nerves were tested as the model built up speed before the undercarriage finally let go of the ground with



**Air under the wheels for the first time. A smooth first take-off at Wagin. (Alex Genovese)**

what turned out to be a perfect take off and climb out. One click of left aileron trim was all that was required to see the model settle into some very smooth circuits around the skies over Wagin. After several circuits testing stall characteristics and flap settings a missed approach was aborted, before a second approach saw the model land safely and in one piece, to the relief of all those involved!

Despite all of the above, the model has now flown successfully on 14 occasions (as of June 2020) and is always a great crowd pleaser".

#### TAILPIECE

Your scribe first got wind of the 747 when I saw Andrew and his helpers testing four large turbine engines and ancillary equipment on a static bench at a flying site (KAMS) near Perth. The noise and drama on power-up was astonishing. I am not ashamed to say that as the four engines reached full power, I watched from behind a nearby car! I then saw the newly completed 747 at Perth's magnificent WAMASC flying site at Whiteman Park, where

it dwarfed the pit area! Andrew taxied the then as yet un-flown and un-certified model for the benefit of the large audience at the model show, and accompanied by young son Nelson, used the P.A. to explain technical details to an appreciative crowd.

The successful certification flights and all subsequent ones to date have taken place at Wagin Airfield, which has become WestJet's newly adopted home. I am grateful to Alex Genovese for his photos of the first flights. In the air the only word to describe the model is 'magnificent'. The realism is amazing. I urge readers to look at videos and other images of the model (see links) to get a better idea of the scale of Andrew's achievement. ✈️

#### LINKS

WestJet: [www.westjet.org.au](http://www.westjet.org.au)  
 Facebook: search 'Westjet'  
 WAMASC: [www.wamasc.com.au](http://www.wamasc.com.au)  
 KAMS: [kamsrc.com.au](http://kamsrc.com.au)



**Almost down after seven somewhat nerve-wracking minutes in the air, Andrew lowers everything for the first landing! (Alex Genovese)**



**WestJet members and the 747 team (Andrew kneeling) at Wagin after the first triumphant flights. (Alex Genovese)**



# AN AFFORDABLE

Dave Batchelor finishes and flies his 98" Vulcan V-bomber built from the Tony Nijhuis plan

words & photos » Dave Batchelor



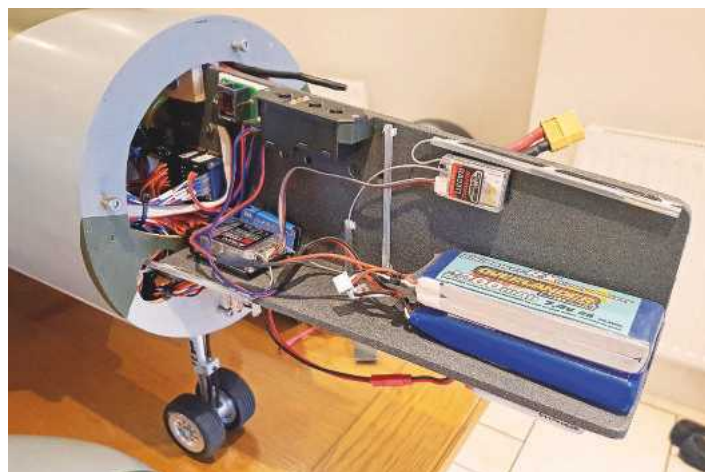
“Finding the C of G on such a large model was going to be difficult”

Running fuel lines and wiring in the fuselage was going to be very untidy as only the holes in the ribs and bulkheads could be used to run them through. Good visibility inside is afforded by the large air intakes so I wanted it to look good inside as well as out. I used 1/4" dowel from the front to the engine bay on each side to carry wires one side and fuel lines

the other, and more dowels side to side to carry the wiring and air lines to the two sides, fixed with either cable ties or Velcro straps.

The inner frame, under the removable nose, to hold the electrics, was made of ply and made as long as possible to get maximum weight at the front where it is needed to balance the heavy turbine and thrust tube. The

frame holds the fuel pump, gear/brake valve and turbine battery on one side, with the receiver, gyro, remote receiver and two radio batteries on the other side. The electronic gear door sequencer and the lighting control PCB is mounted on the underside of the front extension, along with the lighting battery. The radio batteries were sized to correct the C of G.



*The long inner frame houses all the avionics and batteries, keeping them well forward to assist the balance point.*



# AVRO PART 2



*Afterburner parts.*

## BALANCE BY SPREADSHEET

Finding the C of G on such a large model was going to be difficult. I was discussing this with my friend, Andy and he said that it should be possible to write an Excel spreadsheet to do this. In no time at all his wife Teresa had worked out the math and Andy wrote a spreadsheet, which not only worked out the longitudinal C of G but also the lateral C of G. Using this, and my wife's kitchen scales, gave me the weight of batteries required to put the C of G where it is supposed to be. Subsequent verification by lifting the model on two points under the wings proved it to be completely accurate and flight testing also showed it to be fine. Well done and thanks to Teresa and Andy!

## LIGHT UP

There are two lots of lighting on the model - landing lights and dummy afterburners. The landing lights use LED lamps from car reversing light bulbs. The retracting mechanism is home-made, and the lamps pop out of the wing using a micro servo.

The afterburners are red LED lamps from car stop lights. The lamps are controlled by a pair of programmable Mosfet switches made by Pololu. These can be programmed to switch at a certain point on a proportional R/C channel. One circuit for the afterburners runs off the throttle channel and the landing lights have their own channel so they can be switched on at will.

## COVER UP

The model was covered with fibreglass using one layer of 28g/m cloth on the top and one layer of 44g/m cloth on the underside. It was the first time I had ever fibre glassed anything and so I started with the rudder. The first side went quite well but I was disappointed to find that it was not all glossy when it dried. I then found

out that it is not supposed to be, and the resin should only fill half of the cloth weave. I really should have paid more attention to the tutorials online! A lot of rubbing down later and I covered the other side correctly, removing any excess liquid before it dried - much better. I then used Z Poxyskinning resin for the final coat, applying it with a very soft, thin and wide paint brush. It dried without brush marks beautifully. Doing the fuselage and wings was bit of a bigger job but overall it was not the nightmare I was anticipating.

After a coat of primer was applied, I could see just how bad the surface finish was! Lots of rubbing down, followed by more filler primer and more rubbing down had it taking shape. I used 3M Acryl-red glazing putty, which dried quickly and could be easily rubbed down to produce a very nice surface.



*Carefully cutting the canopy to fit.*



*Glassing a wing. Not the daunting job that it first appeared to be.*

## MOULDINGS

The cabin and the dummy engines are supplied as vac mouldings, but the large underside dummy engine mouldings were done in two halves, so a joint was going to be visible. Vulcan co-builder, John Rands had given up trying to make a nice job of his and in the end he set about making a mould from which he produced four nice glass fibre engine casings. He kindly lent me the mould and I made four for myself. I later repaid him by making a mould for the bomb aimer's window 'bulge' on the underside of the nose section, which worked out well and I lent him the mould to make his.

One thing I had not allowed for when deciding where to break the fuselage for my removable front was the location of the cabin moulding. This, it turned out, was almost half



*Canopy slot after cutting out and lining.*







**Finished canopy showing the matching retaining block.**



**Side view of the finished canopy.**

on each side of the break; it was going to take some figuring out! It sits on the fuselage just as it turns down towards the front, so I had to deal with fitting a very thin vac moulding to a surface with compound curves, which also had to be removable. I first made a base by soaking 3mm balsa sheet and strapping it to the fuselage. Several re-soaking and strapping sessions were required, leaving it to dry completely in between and resulted in a nicely shaped piece that fitted perfectly. I then had to cut this to go inside the cabin moulding, knowing that if I took too much off I would be doing it all again. Once they fitted together, I made some internal formers to support the moulding and the result was a very strong cabin that fitted the fuselage well. As the cabin is a sealed 'bubble' it is likely to be affected by the sun, so holes were drilled prior to finally



**The bottom of the canopy slot is the perfect location for the power switch and turbine I/O connector.**

fitting the cover so that all areas of the cabin are vented and won't blow up in the sunshine. Now I just had to make a removable mounting system for it...

An idea came to me to use a block glued to the underside, which could be lowered into a slot in the top of the nose cone just to one side of the central former. A box was made in the front cover around the slot, resulting in a firm fixing of the cabin. But how to stop it popping out? I had planned a refuelling probe in the nose and decided to make this into the final securing pin for the cabin. A piece of thin piano wire was fitted to the inner sliding piece of the probe, which slides in a piece of 'snake' inner up to the cabin area and goes into a hole to hold the cabin down. I later found that the PowerBox sensor switch and the turbine I/O board could be fitted below the slot, allowing fast access to the on/off switch by simply removing the cabin.

All the servo extension leads were made using PowerBox twisted cable and terminals so that each one is exactly the length required. If you have the correct crimping tool and take your time it is not half as difficult as it seems to make servo extension leads. Every connection can be scrutinised and 'tugged' to be sure it is good before fitting the shell.

## COLOUR SCHEME

The time for painting was fast approaching. I had decided that I wanted a camouflage scheme rather than the anti-flash white, but with a grey underside to aid orientation from a distance. The restored XH558 is probably the easiest full size to model as so many photos and so much information is easily available, but she has the wrap around camouflage scheme, so I looked elsewhere. The Vulcan based at Hendon RAF museum was almost chosen but sadly she is nosed into the corner of the bomber hall at Hendon, looking very sorry for herself. It also meant that good all-round views were difficult to get.



**Undercoat in progress on a quiet Saturday in the company workshop where Dave works.**



**Making the thrust diverters.**





*Thrust diverters in place inside the copious air intakes.*



*Final fit out and fettling.*



*The nose leg bay was fully lined.*



*Repairing the twisted fin.*

## “The time for painting was fast approaching”

I settled on XJ824, which is based in the large hanger at Duxford. She was stored outside for many years so there are many unrestricted photos of her on the internet and now she is inside so you can walk around her and also get good views from the gallery. Modelling XJ824 meant a lot of bespoke decals were needed and Nigel Wagstaff at Flightline Graphics did a fine job of creating them. Luckily, he had to go to Duxford for something else and took the necessary photos for me while he was there. I used the same paint codes as Duxford had, using BS627 for the underside, BS637 for the top and BS241 for the green. The underside was painted first, followed by the top grey. I made a frame to support the aircraft on the main wing tubes (wings partially fitted, leaving a gap) and this meant that the airframe could be rotated 180 degrees to do the underside and the top at various angles as required. The paints were from Avenue Coatings in Colnbrook near Heathrow, who not only mixed the colours but were able to supply aerosol ‘rattle’ cans from my mix of paint for touch up purposes.

Masking for the green took a time! It might look random, but most Vulcans have close to the same green markings, so armed with a suitable plan photo and having worked out the scale and several base points, I started to plot out the position of the green sections as close as I could. I started with 3M 3mm wide masking tape, which was able to go around the curves very well. With the shapes plotted

out in tape, I then used wider tape and paper to cover the airframe. I did half at a time, with one wing on, which was just do-able in the workshop. Once sprayed the tape was carefully removed with the paint still wet. I let the paint dry hard for a week before turning it and doing the other half.

### **RADIO CHECK**

I took the model to Motors and Rotors for Dave Wilshire to case his eye over and check the set-up of the radio. All was fine, except Dave noticed that there was a slight twist in the fin! He had flown another TN Vulcan and this one had an even worse twist in the fin. I do not know how it was not noticed before and Dave said it was only slight and would fly okay, but once you see something like that you always know it's there. I had to fix it even if it meant making a new fin. By removing the wood from one side and cutting around the carbon tubes going up through each rib, I was able to take out the twist by clamping it in the correct position to an adjacent shelf and applying glue around the tubes and ribs. When it had dried, it stayed in the right place and all (!) I had to do was re-skin, glass and paint it. It set me back weeks, but I know it is right now.

The decals were fitted and needed fixing and protecting. I did a lot of research and bought a lot of different spray coatings. The decals supplied by Flightline graphics were very complete and there were going to be several on the underside that I would not be



*Neat turbine installation.*

using, so I used them for testing the clear coats. Most of them affected the decals badly and I almost gave up hope of finding something when I came across Hammerite clear matt spray. It worked a treat, covering the paint without marks, and it didn't affect the decals - or so I thought. Small decals could be sprayed over and were not affected. But when I did some larger decals they started to crinkle! The solution is to use Tamiya X22 clear gloss over the decals, applied by brush, and then spray them with clear matt to leave a matt finish and undamaged decals.

The roundels and tail colours were all airbrushed using paint masks supplied with the decals by Flightline and blue and red paint from Avenue Coatings - FPF3 (bus red) and RAL9003 Blue.

### **FIRST FLIGHTS**

The model was taken to Phoenix MAC, where the turbine was run up and adjusted.



**“It flew even better and the gyro totally locks it in like it is on rails”**

All looked good and the surface of the model at the rear showed no signs of getting hot. I did not take the wings that day just in case I was tempted to fly it!

A jet day was planned at Sculthorpe in Norfolk, so with much trepidation the model was loaded into the van and I set off. The weather was perfect, with a breeze blowing but not too bad. The model was assembled and fuelled up. A small problem was noted with the gyro and as it would not respond to tinkering with the decision was made to bypass the gyro for the maiden flight.

The engine was started and Dave Wilshire, who had kindly agreed to test fly the Vulcan for me, taxied her out. The model lifted off very smartly, flew superbly and looked wonderful, despite having no gear doors or belly markings. Dave landed and taxied back in, proclaiming it to be a success.

After a good check over and refuelling I took it up for a flight myself and with a pounding heart had a very pleasant six-minute flight. Landing was as uneventful as the flight itself



*Looking the part on her maiden flight. LED afterburners add to the effect.*

and I had a beaming smile as I taxied back in. They were the only two flights that day for the Vulcan as I wanted to give it a good check over on the bench.

The only problems found were one of the main gear bogies had loosened a spring slightly, resulting in the bogies not hanging together straight on landing approach, something I only noticed in the photos afterwards. The gyro problem was resolved, and the system was reinstated.

### POST FLIGHT TWEAKS

Since the maiden flight, I have fitted gear doors, each one fitted with a micro servo controlled by an SC-271 electronic sequencer made by the Hando Computer company and available on eBay for \$14. It's a really simple device, programmed from a laptop, and seems to work great.



*XJ824 comes in for a smooth first landing.*



*Clamping the gear doors to match the underwing shape.*



*It's well worth the effort for a neat and tidy finish.*



*Adding the panel lines back in Dave's home workshop.*



The main gear doors have a compound curve to them so 3mm ply was soaked and then clamped in place to the shape of the fuselage and left to dry. Afterwards they fitted in place perfectly.

There are small doors behind the main bogies, opened and closed by the legs themselves. The linkage for this took some working out! After the first couple of landings I found that the main oleos, when fully compressed on landing, allowed the rear bogie wheels to just touch the doors, causing some damage. I ended up shortening the small doors to clear the wheels (as I should have done in the first place!) and extending the main gear doors, with all the re-covering and painting that entailed. Nothing is easy you know!

As I mentioned earlier, I also made a bomb aimer's 'bulge'. The moulding process was not as bad as I thought and I soon had a new bomb aimer's window taken from the mould. The mould has now gone off to at least two other Vulcan builders in the UK.

I also finished the underside markings, panel lines etc., which are so clearly visible when flying. The panel lines were all drawn on by hand with a pencil and then covered with the clear matt spray to protect them.

The final two pieces I made were radio aerials that go on the top of the fuselage; very delicate, so both are removable for transport.

### DELTA DELIGHT

The four wing control surfaces are supposed to be set up with the outers as elevons and the inners purely as elevators. This caused some set up oddities with the gyro and I decided in the end to set the entire wing up as a normal delta. This simplified the set up as all four servos now went via the gyro.

The JMA (Jet Modellers Association) season opener/AGM was held at the BMFA site in the Midlands. Apart from an excellent facility, they have a very nice grass field. This time the gyro was in and working. It flew even better and the gyro totally locks it in like it is on rails. The full elevons meant the control throws could be reduced and adjustment via the transmitter was much more straightforward.

As a member of St Albans MAC, I was very proud to receive the Basil Dodds 'Best New Model' trophy at the club's 'New Models' night for the Vulcan in early 2019.

I would like to thank John Rands for his assistance and for sharing some of his solutions and also to Dave Wilshire for his invaluable advice during the build and for carrying out the maiden flight for me. ✈️



*Panel lines and small decals all add to the scale effect.*



*Dave's Vulcan won the Basil Dodds 'Best New Model' trophy at SAMAC's New Models club night.*



*A final look at the impressive jet as the Vulcan completes a wing over.*





Good looking  
BJ Craft Epilogue.

# NEW MODELS, NEW PILOTS

Keith Jackson looks at two state of the art F3A aerobatic models, and also provides inspiration and advice for new Clubman pilots words & photos » Keith Jackson

**N**ew from BJ Craft this year is the Epilogue, which is a monoplane based on their second generation or G2 fuselage structure. The fuselages of all the models in BJ Craft range are structurally similar, comprising a moulded glass fibre fuselage inlaid with balsa sheet and an inner layer of glass. This creates a glass-balsa-glass-sandwich which adds significant stiffness to the fuselage structure, whilst maintaining a low overall weight. Contrasting these cavernous fuselages to ones typically flown in the 90s, such as DSM Excelsiors and Typhoons, really shows how construction techniques have changed and developed in the F3A world.

Due to this kind of construction flying weight can be very low, although this is governed by the flight batteries chosen. Ready to fly weights excluding flight batteries can be as low as 3500g, which includes a 2S LiPo for radio gear. Given the absolute FAI weight limit is 5000g (plus a 50g tolerance for scale inaccuracy), this means flight packs weighing up to 1550g may be

used! F3A models tend to use 10S packs in the capacities from 4500 - 6000mAh and weighing between 1050 - 1400g, although clearly higher capacities may be used in the case of the Epilogue.

Spanning 1.88m and being exactly 2m long the Epilogue follows a typical formula set by BJ Craft for very large fuselages, with lots of side area and very lightweight, built up, film covered wings and tailplanes. In the case of the Epilogue the latter are fixed with elevators, set anhedrally to the fuselage, as opposed to the all moving tailplane sometimes used by BJ. The wings feature a double tapered, slightly swept planform, more commonly seen on European models such as the CPLR Galactika and Oreka, and Pegase Composites Excess. The second taper starts around half wingspan and the wing chord reduces strongly towards the wing tip. The resulting wing tip planform is quite narrow, allowing rolls to start and stop quickly, which enhances rolling definition within manoeuvres.

Wing fences are positioned near the wing tip and testing by numerous pilots on other



There's not much inside a modern F3A model.





Rear view of the Epilogue.



Oblique view of the Epilogue. Note the wing fences at the tips.

models such as the BJ Craft Element and Agenda have confirmed they help to maintain heading and prevent early tip stall when approaching Spin manoeuvres. In addition, I also feel they help maintain heading when exiting vertical manoeuvres such as stall turns or square manoeuvres.

The model can be fitted out for either monoprop or contra drive and this must be specified when ordering. Typical monoprop drives include Hacker Q80 13S, Plettenburg Advance 30-10, Himax 6330 F3A, BJ Craft I and Y drives, and the Adverun SD (single drive). Typical contra drive systems may also be used such as the Adverun Contra drive, BJ Craft X drive and the Brenner V4 contra drive. Both these systems tend to use 22" diameter, carbon propellers and a wide range is available from manufacturers such as Falcon, Mejzlik, APC and CK Aeros.

### CLUBMAN SCHEDULE

My own entrance to F3A started with the Clubman schedule in Scotland back in 1994 and together with my Irvine 36 powered Chilli Breeze it really gave me something to focus on after years of beating up the strip with Gangsters and the like. The schedule provided a

real focus and challenge which I'd never faced before and it was like a breath of fresh air to my ailing enthusiasm at the time.

For many F3A pilots in the UK the GBRCAA Clubman schedule is their first experience of a turnaround aerobatic schedule and the place where they really begin to learn about aerobatic flying. It draws together several aspects that the pilot needs to understand and master if they are to have any real success in F3A. These are:

1. Understanding the geometry of the manoeuvres shape
2. Flying the model where you want it to fly; i.e. positioning and tracking
3. Linking individual manoeuvres into a continuous turnaround schedule
4. Understanding and coping with the effects of wind
5. Flying in front of judges!

To look at, the schedule is not difficult to fly; anyone can fly a loop and most pilots are able to attempt a slow roll. A stall turn or the spin are one of the first manoeuvres a pilot may attempt after going solo, so individually it's fair to say that most pilots, having attained an A certificate, should really be able to have a go at this. The difficulty begins when the pilot must

fly the loop, or rather two loops, directly in front of them. The loops have to be round, concentric and the same size, and these criteria alone rule out the majority of loops ever flown.

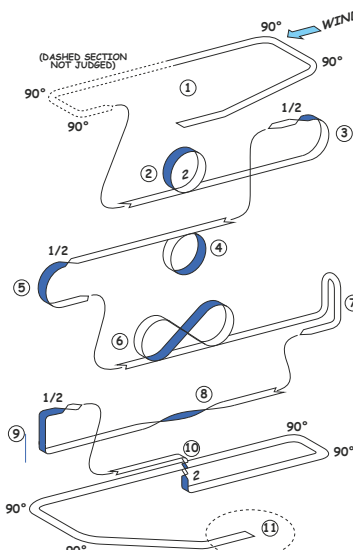
The next major hurdle is to trundle up wind and perform the first turn around manoeuvre, which is a half loop and half roll, otherwise known as an Immelmann Turn. This does what it says on the tin - it reverses the direction of the model and prevents it flying off to the horizon. To allow our aerobatic sequences to flow continuously our schedules have many turn around manoeuvres, which must be flown in the correct place on the flight line.

The next manoeuvre is a single outside loop, again pretty simple stuff in isolation, which is then followed by another turnaround manoeuvre, the Split S or half roll followed by a half loop. In theory this should bring you back to your start position.

I think it is at this point if linking the manoeuvres together is successful or otherwise for the pilot. If after the Split S turn the model is heading up wind at the correct height, and traveling along the flight line, then the next centre manoeuvre will occur without much fuss. This is a situation that can occur almost naturally, or more likely, as the result of several



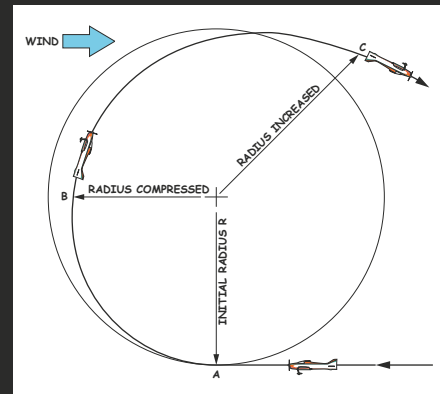
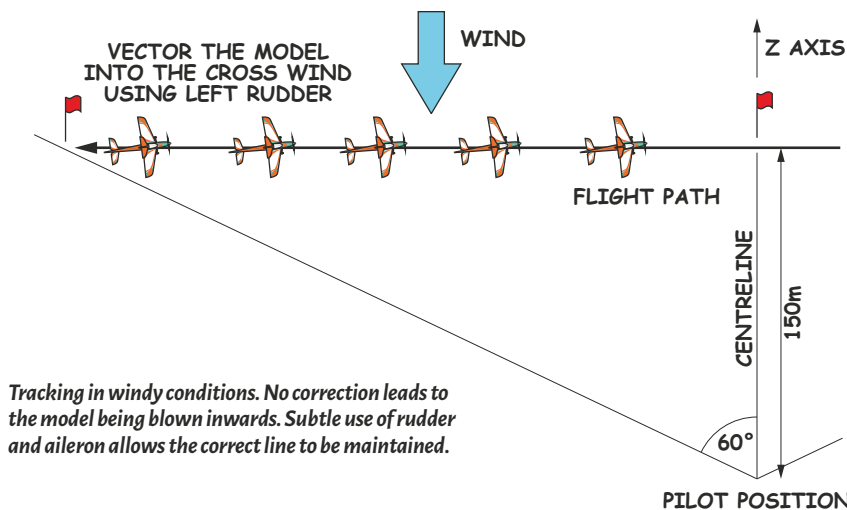
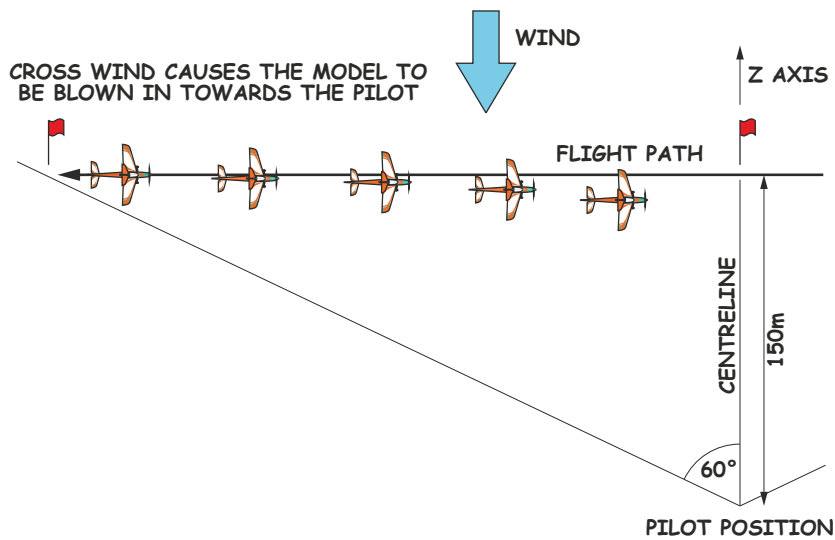
Clubman pilot, Brian Bates getting ready for the Hurley National League competition earlier this year.



- C-01 RECTANGULAR TAKE-OFF SEQUENCE
- C-02 TWO INSIDE LOOPS
- C-03 IMMELMANN TURN WITH HALF ROLL
- C-04 ONE OUTSIDE LOOP
- C-05 SPLIT S
- C-06 CUBAN EIGHT WITH NO ROLLS
- C-07 STALL TURN
- C-08 SLOW ROLL
- C-09 HALF SQUARE LOOP, HALF ROLL ON EXIT
- C-10 TWO TURN SPIN
- C-11 LANDING SEQUENCE

GBRCAA Clubman schedule.





Headwinds strongly affect the shape of looping manoeuvres.

### SKYLEAF LEADER

This is a top of the range F3A model designed by Tetsuo Onda, who is the Japanese number one pilot and who was World Champion in Argentina 2017. At this event he used the Skyleaf Leader version g, though this has now been superseded by the A1 version, which is built by Hui Yang in China. Onda used, and still uses, the very successful and robust Adverun contra system ([www.adverrun.com](http://www.adverrun.com)), although it is also possible to use a conventional mono prop system.

Both versions are distributed via Futaba and available to purchase, although the cost of the more recent A1 version delivered to the UK is pushing towards £7,000! For this you get a top of the range composite fuselage, balsa wings and tailplane, all painted to the best standard you can buy. For those interested in buying a model aircraft instead of a small car, more details can be found at: [morris-hobby.securesite.jp/38\\_1546.html](http://morris-hobby.securesite.jp/38_1546.html)

The much more reasonable earlier g version was built by BJ Craft under license and distributed again by Futaba. Several of these models found their way to the UK via Bondaero and it is one of these that I found myself being able to build earlier this year.

The model is supplied in typical form from BJ Craft, with a beautifully crafted,

years of working out how and why model aircraft do the things they do for a given control input, in all weather conditions. If the model is not doing the latter, then you may have a fierce battle on your hands to get it into the right position before even thinking of how to do the next manoeuvre.

The two inside loops, or the outside loop, might sound easy to do but remember that the schedule should be able to be flown in all reasonable conditions from calm air to strong headwinds, or ninety-degree crosswinds, which significantly affect the shape of looping segments. The challenge facing the pilot to do this without errors is immense and equal to any other complex sport you care to mention. It is actually this endless degree of difficulty that, for me, is what F3A is all about and that makes it worth doing.

So, to conclude this section it is worth saying that when you've really mastered the Clubman schedule you stand a very good chance of being able to attempt any of the FAI schedules that might come your way as the principals involved are exactly the same. Once you gain the confidence to fly the basic schedule, more

complex manoeuvres you've never even thought of can be attempted without writing them off as unachievable. It may be that flying the more difficult FAI schedules is just not your thing, which is fine; the Clubman schedule will still make you a better pilot regardless.



Skyleaf Leader F3A biplane.





**MKS HV6130 servo mount in Skylaf Leader wings.**

lightweight and well finished balsa/glass composite fuselage, film covered built up wings, tailplanes and rudder. The wings are incredibly light, with only a 9% thick wing section, and looking at them it is difficult to believe they can withstand the rigors of an FAI F schedule. The bottom wing weighs just 326g and is swept with slight dihedral. The top wing is also swept, has anhedral and weighs slightly more at 341g.

As mentioned, the model is marketed by Futaba, along with a servo package comprising BLS 173SVi HV servos, which are used on the four ailerons and two elevators, with a BLS 175SV HV servo used for rudder control. The aileron servos are intended to be mounted vertically, meaning when fitted they would stand some 19mm proud of the wing surface. I chose not to use these servos and instead used MKS HV6130 wing servos, which feature an all metal case and gears, and weighs just 22.5g. More importantly, the mounting lugs allow the servo to lie flat in the wing. This, however, meant taking the dubious decision to cut into the finished wing structure beyond the normal servo aperture and great care was taken to peel back and preserve the film covering prior to



**Finished aileron linkage with MKS servo buried in the wing and covered back over in film.**

doing this. I constructed some mounting trays from lite-ply, and these were shaped to match the inner profile of wing skin and then fixed with a mixture of epoxy and micro balloons. In hindsight it would have been better to lay some 0.6 oz./sq. ft. glass cloth between the mount and the skin to help spread the load better.

Whilst BJ Craft supply a complete sets of Z bend linkages for their models, I chose to use 2mm turnbuckles and standard ball links fastened with M2 bolts. Back in the day, when YS engines were used by almost everyone, linkages had to be far more robust using ball raced rod ends and 2.5 - 3mm pushrods, to resist the effects of vibration. Today, however, electric motors produce very little low frequency vibration so linkages can be a lot less involved, lighter and a heck of a lot less expensive.

Elevator servos were similarly buried in the tailplanes and accessed through the root rib in traditional fashion, and again used M2 turnbuckles with ball linkages. To save weight I made up a long four wire extension lead to feed both elevator servos whilst allowing individual control over each servo.



**Rudder and elevator servo installations.**

The rudder was directly driven using an MKS HV747 servo mounted locally, using an M3 alloy pushrod. A thin carbon cover was fashioned to hide the rudder servo installation and also reduce drag.

### MOTOR & ESC

Since this model was destined to be my number one competition model for the 2021 season, I chose to use the king of the hill powertrain, the Akiba contra drive. This is an expensive option and other solutions are also available such as the Adverun or the BJ Craft X drive. However, my fuss free experience in the previous year running this wonderful Japanese drive in my Element swung the decision for me.

The updated Akiba drive now uses eight Ø10 rubber isolators and was mounted against a floating 3mm thick carbon plate, which itself was then bolted against a carbon ring bonded into the fuselage nose. This arrangement would allow fine adjustment of the drive's thrust line, which would be required later in the trimming process.

I've previously mentioned the D3 ESC from Adam Dębowski and wanted to try it in the Leader. Weighing just 75g this incredibly



**Akiba drive waiting to be installed.**



**Front mount arrangement.**



**D3 mounting system uses a 1mm carbon plate taped to the ESC.**





**Mounting system complete - internal view.**



**Mounting system complete - external view.**



**Battery trays using an end stop arrangement.**

light device can handle up to 120A if sufficient cooling air can be supplied in flight. The instructions that come with the D3 stipulate this and suggest that the ESC would fry at 50A without correct cooling. Having run the Akiba drive in my BJ Craft Element using Falcon 22" x 22" props front and back, I knew it could draw up to 98A during a typical F3A flight, so I had to provide substantial cooling for the D3 to survive.

I now came up against a problem in that the Akiba drive blanked almost all the frontal area of the cowl and would not allow a significant airflow into the fuselage behind it for cooling purposes. After a bit of head scratching, I decided the way forward was to mount the ESC with the heatsink protruding through the fuselage skin. I'd see this technique used once before on German pilot Peter Haase's Progress series of models, where the Jeti Spin 99 heatsink was mounted externally in the airflow. My implementation

of this saw a hole cut in the bottom of the fuselage and a mounting system devised to hold the D3 in place without stressing its circuit board.

I left the drive battery placement until the end of the build as the very light structure of the model meant the location of the batteries would strongly affect the Centre of Gravity (C of G) of the model. The batteries I would initially be using were LPD 5500mAh 25C 10S packs, which weigh 1220g. The battery tray construction in F3A models varies markedly from simple Velcro strap arrangements to clip in trays that are retained by a screw, and for most pilots this is an uninvolved part of the building process. My solution was to use end stops to mechanically hold the LiPo pack in position and a single Velcro strap for retention and I have used this method for several years now. The balance of the model can be adjusted by moving the battery tray if required, and this is attached by two M3 screws to two pieces of

carbon angle sections 15mm wide, which in turn are bonded to the fuselage sides.

Once complete, with some additional reinforcement on the undercarriage plate to accommodate flying of rough grass, the overall model weight was 3590g, which is very low for a large F3A biplane, and would allow use of 6000mAh packs or larger if required in the future.

**Underside of Skyleaf Leader, with helping hand from Adrian.**



**Skyleaf Leader shown alongside Adrian Harrison's Elixir for scale.**







Top UK F3A pilot Brandon Ransley helping out at the recent GBRCAA 'New to Aerobatics' training day.



Motley crew of F3A pilots attending an impromptu training session. Left to right: Adrian Harrison/Elixir, Kevin Caton/BJ Craft Element, Thomas David/Cold Draft and Brandon Ransley/Elixir.

### GETTING IN TRIM

I initially had the C of G too far forward as early flight tests revealed significant down elevator was required to hold inverted and it would not hold a hands-off 45° inverted climb, along with several other trim issues. After a process of adding wheel balance weights to the rear fuselage and repetitive flight testing, I settled on moving the battery rearwards by 60mm! This allowed the Leader to maintain inverted flight with very slight down elevator pressure, reduced correction during rolls and it also held 45° inverted climbs and vertical dives much better. Some slight tweaking of thrust line was made, and the model will now track vertically upwards with no corrections. No differential was used on the aileron setup as rolls were already very axial.

Some slight rudder/aileron and rudder/elevator mixes were implemented, and the Leader will now groove through any of the high rudder input manoeuvres with ease. Rolls are brilliantly defined, with the wing tips starting and stopping in an instant. BJ Craft refer to this wing planform as a low rolling resistance design; the wing tapers at mid span resulting in wingtips that are very narrow. The combination of this and the 9% wing section allows point rolls to be superbly defined by the pilot, requiring very little effort to produce very crisp start and stops.

The D3 ESC completely dominates the model's speed with the massive amount of braking it and the Akiba contra drive generate. This has taken some getting used to, requiring me to fly the model with throttle open most of the time, instead of the more typical constant adjustment of throttle to counter speed build up when the model is diving through manoeuvres. For example, P21.01 Vertical 8 with half rolls; the first part of the manoeuvre is from mid height where the model is pushed down into the outside loop. Whereas conventional wisdom is to reduce throttle to counteract the speed build up, the throttle is simply held open and the speed of the model is almost completely

controlled by the D3. This allows the pilot to really fly the model round the loop rather than having to think about airspeed changing significantly and how this affects the radius.

One final nice aspect of the Leader is that its aerodynamically slippery design allows it to handle all wind conditions and draw less power than the large fuselage, draggy monoplanes that are currently in use. My BJ Craft Element will typically leave 22% capacity after a P21 schedule, whereas the Leader will leave over 30%, which subsequently does not stress the LiPo packs as much. This also allowed me to use my more normal Optipower 5000mAh 25C packs, which weigh 125g less than the LPD packs, giving a ready to fly weight of 4710g.

### INTRODUCTION TO AEROBATICS DAY

A great way to discover more about F3A is to attend one of the GBRCAA's 'Introduction to Aerobatics' Days. Kevin Caton reports:

For around four years there have been 'Introduction to Aerobatics' days held at BMFA Buckminster, to give newcomers to aerobatic flying an opportunity to learn the basics of setting up a plane and flying with purpose and precision. These are organised and run by Ashley Hoyland and John Morton and are held on the first Wednesday of every month - contact the BMFA at Buckminster for details.

This year we planned some additional training days to give pilots of all levels of skill and experience the opportunity to refine their flying skills through group coaching and observation. The Covid-19 pause meant that we couldn't start these days until mid-year, but in late July a group of 11 pilots met at the excellent Buckminster site for a day of deliberate practice.

A precision aerobatic schedule consists of a continuous sequence of manoeuvres flown in a defined area approximately 150m in front of the pilot and limited by a 60-degree boundary either side of the pilot and 60 degrees upwards. The manoeuvres flow from centre to end in each direction, with the end manoeuvres used to reverse the direction of flight. This presents

the schedule so that it can be judged easily. Flying in this way can be harder than it looks – there is no opportunity to fly around to reposition if your manoeuvres go astray. Also, flying at a constant 150m in front of you, especially if there is any crosswind, can be a challenge.

For our first training day we set up the usual aerobatic box with marker poles on the 150m line, but with the added assistance of a 'depth judge' in two-way radio contact with the flight line to give immediate feedback to the pilot's helper on the distance of the flight path from the 150m line. We did this for two flights each and the results were very useful. All the pilots were able to track the 150m line well on a breezy day with a moderate crosswind component. From the pilot's viewpoint this depth is closer than you might think!

We also departed from the usual practice of flying complete aerobatic schedules. Most people can fly individual manoeuvres quite well, the harder part is stringing a sequence together without going off track. For the day we developed sequences that omitted all the manoeuvres in the centre of the aerobatic box. By just flying a straight track through centre, you have the chance to correct any height or flightpath errors and can concentrate on getting the end 'turnaround' manoeuvres more precise, to set yourself up better for the centre manoeuvres when you come to fly a complete schedule. Again, we found this worked well.

We had a group of pilots with different levels of experience, from past and present UK team members, to others who are in their first season of competition flying. There was plenty of coaching given at all levels; even the more experienced pilots make plenty of mistakes - they can just hide them a bit better!

Overall, we felt the day was a great success and there are two more planned for later in the year. Contact the GBRCAA for more details:

[www.gbrcaa.org/smf/index.php?board=45.0](http://www.gbrcaa.org/smf/index.php?board=45.0)





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# ADVENTURES IN ELECTRIC

Chris Williams and chums try their hand at a spot of electric powered glider tugging

words & photos » Chris Williams

It all started a couple of years ago, when my long-time flying buddy, Barrington V.

Smallpiece built a miniature scale glider - a Skylark from the West Wings kit. Having towed up my large scale gliders for more years than I can remember, I think it was as a form of punishment that he set up a small foamie Wot 4 with a tow release attachment and arranged for me to tow him up for a change, having secretly programmed my transmitter for me to fly the tug. With the utmost alacrity, I saved the day by handing the Tx over to my pal Motley, grabbing my trusty camera and setting off across the patch to a safe distance...

What I hadn't anticipated was just how much fun this was going to be, and it set off a chain of circumstances, the first consequence of which was the design of the 1/7th scale Wolf, a recent plan feature in this magazine.

Electric towing is not a new phenomenon and as far back as a decade ago we started to see some very muscular electric tugs towing up some pretty large, scale gliders. This state of affairs didn't last very long, however, due possibly to two factors. First, large LiPo batteries are very expensive, and second, it takes an inordinate amount of time to charge them, which is pretty much why electric cars haven't really taken off yet in a big way.

Prior to my new tugging experiences, I had been experimenting with the fitting of electric 'sustainers' to some of my designs. The idea was that, on days when the wind was forecast to be light and unpredictable, such a scale model could be launched with no fear of a landing out at the bottom of the slope (recent changes to the White Sheet and Wessex clubs' rules now allow this to



*History repeating? The electric Cub tug experiences some difficulty with the Petrel on the back.*

happen). The motors used to power these relatively large gliders were G60s from HobbyKing, currently priced at just under £53.00. These require a 6S LiPo, but it seemed a good idea to gang together two 3S LiPos, on the basis that they are relatively cheap to buy and if one goes duff you haven't got the cost of an expensive 6S replacement. For a while this worked out splendidly, until the weather intervened, and we didn't see suitable conditions emerge for just about the whole of 2019!

## WOLF RETURNS

So, back to the Wolf...

Although a little heavier than the Skylark, the Wot 4 had no problem towing her up, and

five or six hundred feet seemed a sensible height to which to tow with gliders of this size. One 3S LiPo turned out to be good for around six tows before a battery change would be required and, as we were fitting the micro-towing around our larger activities, two batteries were completely adequate for a day's flying.

Filled with this new-found enthusiasm, I set to and designed a Slingsby Gull at one-seventh scale. This one, with its monocoque fuselage, was a little bit heavier again compared to the Wolf, and now the little tug struggled to get up to take off speed, although once airborne things returned to normal.



*Where it all started - foamie Wot 4, 1/7th scale Wolf and the Slingsby Gull 4.*



*Business end of the 'Williamsley' tug, with the Hangar 9 J3 Cub behind, both fitted with Turnigy G60 motors.*



# C AEROTOW



*Above: The Wot 4 comfortably tows the smaller of the Wolfs.*

*Left: During their dual tow the Wolfs strain to stay as far apart as possible!*

## G60 TUG

*'What', we wondered, 'if we were to utilise the same motors in the large E-assist gliders, and build a larger tug around them?'*

Having just built the fifth scale Wolf, scaled up from the aforementioned smaller version, this added the impetus that was needed, and my pal Motley and I fell to the task of constructing the beast. Based on the well-proven and reliable Greenley, but scaled down to a suitable size, and fitted with an extended nose, this tug was fitted with a G60 motor and had room for four 3S 2200mAh LiPos. Strictly for laughs, we finished her in an identical colour scheme to Smallpiece's standard size version, thus claiming that the new tug was therefore a 'scale' model.

For the initial tests the chosen victim was the larger Wolf, which, at a comfortable 5lbs AUW, shouldn't prove to be too much of a challenge. The power from the tug was perfectly adequate and, once again, a six-hundred-foot ceiling seemed entirely appropriate for glider release (I should point out that our club has a CAA exemption to 1500 feet).

On a roll now, I pondered 'What next?' and set to designing a fifth scale version of one of the most iconic of British gliders, the Slingsby

Petrel, again recently a plan feature in this magazine. With its sealed ailerons and total lack of struts and windscreens the Petrel proved to be on another efficiency level altogether and now flying comparable to that of the larger stuff could be obtained. The Petrel will soar in the lightest of conditions and, despite the narrow wing tips, is perfectly safe at the stall.

Practically fizzing now, and giddy with excitement, I set to designing a fifth scale version of the little-known, one-off Brazilian Flamingo sailplane. Having built a 1:3.5 scale version some years ago, I knew this to be another elegant and efficient machine. Once again, this proved to be a delight to fly, so much so that Motley, himself overcome with excitement, just had to have one himself, and before you could say 'overdue club fees' there were two of 'em.

It was at this stage that a cloud started to eclipse our otherwise pleasurable activities...

## TRICKY TUG

It seemed that our new tug had stall behaviour such as to soil the stoutest of trousers. It turns out that tugging is not quite the effortless endeavour that those tricky tug pilots make it out to be:

- You might think you are steering NNE, but the tug might decide NNW is a much better option - and it doesn't ask for permission first.
- You might be under the impression that you're climbing at a steady rate, when the vario tells a different story.
- Turning left or right can cause the towline to sag ominously, and the resultant snatch can wrench both models into unnatural attitudes. (Not a problem for the fearful glider pilot, who will already have hit the chicken switch!)
- And climbing too steeply, not something you can easily judge from the ground, can result in both models coming into uncomfortable contact with our old friend, Mr. Stall.

It was in this last regime that trouble reared its ugly head. Once stalled, the tug could not be un-stalled without at least 150 feet of altitude in the bank. I have seen literally thousands of tows take place with a variety of Greenley tugs and never a one without the tug behaving impeccably, so some chin-scratching puzzlement took place.

The wing, boasting a symmetrical section, was as straight as a die. The CG was well forward.



*The Williamsley with the 1/5th scale version of the Wolf.*



*All's well etc...*





**Almost all the current fifth scale fleet.**

Yet several divots in the surrounding area testified to the results of any episodes of Dumb Thumb Syndrome.

Now, I'm as hard-of-thinking as any other armchair aerodynamicist, but I had a pretty shrewd idea what to do about the situation. Another wing was constructed, this time with the same wing section as most of my gliders - an under-cambered section that has excellent low speed handling characteristics and which has proved itself time and time again over a lifetime of model building.

By this time, we had all built up a healthy mistrust of the machine, bordering on fear, and now, when the First Flight beckoned, we shuffled about, not looking at each other. Three straws appeared, and I was relieved not to have chosen the short one. We needn't have worried, as it turned out, as the tug was now as stall-proof as it was possible to be, and the incontinence trousers were later sent off to charity. This time around I had opted for full length ailerons and, again a glider procedure, they were programmed to come up for landing. This produces a nose-high attitude, thus increasing drag and thus far it seems to work pretty well.

Not content to keep the status quo, Smallpiece recently turned up with an ARF Hangar 9 J3 Cub, again fitted with the trusty G60 motor and two 5200mAh 3S LiPos. Also, based on his theory that any plane without a tow release is a waste of space, he had fitted same. Now we were talking - scale tows! The Lad has a lot of Cub history behind him, having campaigned a 1/4 scale Cub for many years, so this was a case of déjà vu for both of us. As I lined up the Petrel behind it, I noticed his face turn white and small tic fired off behind his right eye...

#### **CAEN CAN**

Puzzled I was, until suddenly it clicked.

Wind back to 2004; the place - a field near Caen in France. This was the Caen Club's annual aerotow and the Cub and my 3.5 scale Petrel were two of the participants.

With the heavy Petrel lined up behind the tug (the Petrel has no wheel, only a skid) our Lad opened the taps and duo lurched slowly forward. (It must be said that this was entirely scale. Some years ago, we watched the full-size Petrel being aerotowed and it took three hefty blokes pushing on the wings to get it moving.) The pair hadn't got very far off the ground when the Cub performed a dainty pirouette and buried itself into the rich French loam, leaving a divot that will forever be remembered as a small piece of England.

Back in the present, Smallpiece was obviously having some species of flashback, so I kicked him hard in the ankle, whereupon he shook himself and opened the throttle. The Cub proved itself to be an excellent tug, with about the same power as the Williamsley (John Greenfield, designer of the Greenley, declared that it could no longer bear his name, what with the new wing section we had fitted) and the French Fiasco came nowhere near being repeated. (It still had its occasional excitement, though!)

Now we were starting to get a little complacent and decided that twin-towing might spice things up a little. Two of the little Wolfs, mine and Smallpiece's, were lined up behind the tug and the rollercoaster ride began. Like two elderly, but sprightly spinsters who had fallen out with each other, the Wolfs



**Tow release on the non-scale tug.**



**Tow release on the Cub.**

strained to stay as far apart as possible, whilst Motley, on towing duties, struggled to gain height, unaware that the flapperons were up and thus in landing mode. Not unlike a flock of pigeons, disturbed whilst feeding, there seemed to be models everywhere, all looking for safe sanctuary.

It was a bit like the old joke, wherein a snail farmer asks a tortoise to look after his field of snails whilst he pops down to the shops. When he returns, he finds the gate open and the snails all gone. 'What happened?', he asks the tortoise. 'Dunno', says the bewildered tortoise, 'it all happened so fast!'

We all got down safely, but afterwards felt a strong desire for some lettuce. Further experimentation proved a little less exciting, but was discontinued eventually, after an outbreak of common sense.

I have always thought that scale gliding offered more than simple powered flight, purely on the grounds that it can take place either on the slope or on the flat, two completely different regimes. Chuck electric aerotowing into the mix and there's never a dull moment - provided it ever stops raining! ✈



**Fifth scale Flamingo climbs behind the Williamsley.**



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DMFC's socially distanced Foamie Warbird Event 2020 about to begin.



# NORMAL SERVICE RESUMED?

As lockdown eases, Whittaker and his Clubmates try to get back to a more normal routine

words & photos » Alex Whittaker

**T**he sheer weirdness of 2020 continues to amaze me. I just hope it does not get any weirder. I have spent most of the summer not visiting shows, not shooting Model Magics and not travelling. It all feels so odd. Normally over the summer weekends I am away at distant events. However, Covid has put that Jumbo in a holding pattern for the time being. Crash Parry and I have had to leave The Command Module II in storage since we are no longer off to Barkston, Buckminster or Old Warden. We have had to readjust.

At home it has got a bit odd, too. Mrs. Whittaker and I have had to re-install our weekends back from Monday to Friday. Under lockdown, I have been eating regular Sunday lunches for the first time in a quarter of a century. With the Welsh barbers shut by law, my hair is so long I look like a superannuated hippy. Lack of exercise, usually incurred by running around flight lines with heavy cameras, means I am getting fat (ter). At the

Club level we are rethinking things too. In fact, the response of my own Club has been typically British bloody-mindedness: 'Let's paint around the problem!'

Everybody has taken lockdown in their stride. No one has got bent out of shape. No one has got upset. Members just decided to pursue their radio modelling by other means. Many built more, tried to buy things by post, and kept in touch with Club members over social media. Recently the Welsh Government relaxed their rules just a smidgeon and we were able to resume a strange form of 'socially distanced' flying at the Singing Kettle International Field. A bit more official relaxation from The Taffia and it became clear our little Welsh Club could hold a small event. Provided, of course, that we kept to the Welsh Covid rules. Now here in Delyn, we are not a glow ghetto. We are a broad church. So, our previously cancelled flying event - especially tuned for bought-in 'leccy models - was suddenly back on!

## FOAMIE WARBIRDS

Everyday loves a warbird, but not everyone has the time or skill to confect one. So, we decided to throw this easy competition open to any foam electric warbird. Mind you, if another type of warbird or model had shown up, no one would have batted an eyelid. On the day everyone was made aware of the health requirements, no one transgressed, and all went well. There has emerged a sort of new 'normality' about social distancing and people are mentally moving on. Accepting rather than opposing, doing rather than moaning. Due to the prevailing strict Welsh travel rules, we had a reduced number of entries on the day, but easily enough for a comp. What mattered was that we were back from the dead.

## PARKZONE TROJAN

The wind was slightly gusty, but nothing to write home about. It mostly stayed down the strip, with a crosswind component that





**Contest Director, Crash Parry, looking like my old Geography teacher...**



**Sandra and Lindsay Todd at The Kettle. Lindsay grabbed an old faithful from the loft - a ParkZone Trojan.**

varied as the day progressed. Overall, the light was appalling. Generally grey and duff, both for flying and for photography. Still, we were out together in the fresh air. When we did get three brief shafts of sunshine in a row, I sallied forth with my cameras.

Oddly enough the first people I saw at the event were two of my own friends from The Wirral, Sandra and Lindsay Todd. Linds had brought his much flown ParkZone Trojan. They must have made a million of those! They are affordable, durable, and always seems to fly well. I must get one to throw in The Command Module II for the summer show evenings.

### HAWK100

Nick Smith, of our sister Club in Wrexham, is well known to these pages as a canny designer. This time he had returned with a bunch of models, one of which we have featured before in RCM&E, in October 2018.



**Nick Smith and O/D Hawk 100, with a letter from The Commander. Wow!**

This was Nick's own design, 68mm EDF (electric ducted fan), 40" span Hawk 100. This was in very rarely modelled Abu Dhabi colours.

Now, apparently, after I published that photo in RCM&E, a serving US pilot brought it to the attention of an Abu Dhabi Base Commander, one Major General Staff Pilot, Ibrahim Naser M. Al Alawi. The Major General instantly recognised the scheme as one of their own. Now that was a long shot! Here are the UAE Commander's fine words to our own Nick:

*"Dear Sir,*

*Recently I have the opportunity to read the October 2018 addition of RCM&E magazine and see some of the pictures of your remote-control model airplanes. In particular I was both surprised and honored to see United Arab Emirates (UAE) Air Force and Air Defence (AF&AD) model of our Hawk trainer aircraft, complete with desert camouflage. I know it took a lot of time and hard work to not only put the plane together, but also*

*make sure that you had an exact match to our current desert paint scheme. All I can say is thank you for choosing to recognise the UAE AF&D in such a distinguished way, and for taking the time to ensure the build and quality of workmanship were nothing but top-notch. I look forward to seeing more of your remote-control model airplanes in future editions of RCM&E magazine and wish you continued success.*

*Yours sincerely,  
Major General Staff Pilot, Ibrahim Naser M. Al Alawi*

All I can say to that is 'Wow' and repeat the point that as keen aeromodellers we honour all brave airmen.

### TYPHOON EUROFIGHTER

In addition, Nick brought his own design Typhoon Eurofighter, also fitted with a 68mm EDF unit and 3S power. At 24" span you might expect her to be a bit twitchy but no, she was ultra-fast, efficient and very stable.



**Nick Smith's own design, 24" span Typhoon. 68mm EDF on 3S power.**







*Final of three O/D jets from Nick is this F-35, fitted with a 50mm EDF unit.*



*Doug Rawlinson brought an unknown but published foam biplane.*

### **F-35 LIGHTNING**

The last of Nick's trio was his 3S powered Lockheed F-35 Lightning. Just for a change this was fitted with 50mm EDF unit! A cracking own design, and a great flyer.

### **ACROWOT**

Doug Rawlinson brought an unknown but published foam biplane and a very well-known foamie, his Acrowot. No one questioned either, by the way. After all, this is Wales - home of the brave, land of the free.

### **E-FLITE SPITFIRE**

My ace Clubmate, Spanish Pete (Borthwick) had brought his 1200mm span E-flite Spitfire. It flew well and was completely 'stock', as they say. He did well in the comp.

### **DAKOTA**

Many of us have bagged bargains at our Club Swapmeet and DMFC's Hon. Treasurer, Bill Lowes flew his nifty Swapmeet Special. This was a well-used, all-foam Dakota that he has restored to full airworthiness. It flew well and only cost him twenty quid and a bit of TLC. As well all know, good Treasurers will never waste money. In these cash-straitened times, maybe there is a message there for us all.

*Doug also brought a well-known foamie, his Acrowot.*



### **TWINSTAR**

The Ford Mondeo of twins, most of us have either owned a Twinstar or have flown a friend's. My energetic and genial Clubmate, John Beck flew his, with some style I might add. Mine didn't have a rudder, but I note that the new ones have. A useful upgrade. John and

Spanish Pete even put up the Club trainer later for a couple of newcomers. Proper Club service!

### **THE RESULTS**

We only found out that our modest Club event could go ahead a few hours beforehand.



*Spanish Pete Borthwick with his 'stock' 1200mm E-flite Spitfire.*



*DMFC Hon. Treasurer, Bill Lowes flew his Swapmeet Special, all-foam Dakota.*





*Twinstar flown by my energetic and genial clubmate, John Beck. It has a rudder, which my ancient one lacked.*



*Even though it was a comp day, prospective new members were offered free trainer flights.*



*Never let it be said that we are not generous with our prizes. LOL.*

Therefore, for our impromptu comp, we only had enough wine and chocolate for Winner and Runner Up prizes! These were judged on flying and were:

1. Nick Smith, Wrexham Club
2. Spanish Pete Borthwick, Delyn MFC.

In the interests of accuracy, I should point out that my dear mate Pete is not actually Spanish, though even if he was, he would still have been Runner Up. The spread of models, and the breadth of our members' imagination on what might just possibly constitute a warbird was most enlightening.



*Socially distanced Prize Giving to Nick Smith, the Winner.*

This was our first DMFC Foamie Warbird Event and after this initial success, there will be more. It is an ideal low-stress comp. Open to all and easy to stage, so what is there not to like? We will be able to advertise it more widely next year.

#### **FF, DT AND OOS**

It so happens that our Club has two keen free flighter blighters. One, Derek May, is our Chairman, so we are exquisitely cool with inclusivity. However, denied his chance

of honour at this year's sadly cancelled BMFA FF Nats, Derek was still putting in some practice. He was campaigning his 28" span catapult glider. Amazingly, this little gem is fitted with a DT!

I well remember first reading about DTs as teenager, many moons ago in *AeroModeller*. Of course, I had no idea what 'dethermaliser' meant. Eventually, I cottoned on to it being a device to wrench the model from the killer grip of a big thermal. A big thermal can scoot a light free flight model quickly to invisibility



*Derek May, DMFC Chairman, with his FF catapult glider. It has a DT, too.*



*Derek shows the tip up mechanism on the dethermaliser.*







Many modellers now use camper vans to tote their models



Spanish Pete's LiPo storage in action. Most LiPos use Velcro anyway, so sticking them to the carpet makes sense.

and often almost certain loss. Now, in those far off days most of us had lost a FF model flying OOS (Out Of Sight) in a big boomer. So, the idea of the basic DT was to set a timer to tip up the model's tail and let it sort of parachute down from the thermal, 'stalled' on its wing. Now a small FF model could never carry the weight of a clockwork timer so we used bits of flammable rope or cord as a sort of fuse. After a set time of burning (more or less!) a trip line to the tail would be burnt through. This line would have been holding the tailplane in its normal position. A small elastic band was fitted to tip up the tail when released. Once the fuse burned the trip line through then, of course, the tail would tip up. Adorably low tech and minimal. However, doped tissue also happens to be highly inflammable and close proximity to a smoldering fuse can spell disaster. I well remember, as a teenager, watching impotently as a friend's model, high aloft, was set afire by a dodgy DT. It was a sort of aerial Viking funeral pyre. Impressively destructive, mind...

### STICKY STORAGE

Like many modellers these days, my fore mentioned Clubmate, Spanish Pete has a handy camper van. He uses it to tote his models up to the field. The camper has a nicely carpeted interior, including the walls. Comfortable and cosy shelter on a bad day and always handy for a freshly brewed cup of tea. Anyhow, what made me chuckle was Pete's 'Lipo Battery Selection And Storage System'. All his LiPo flight batteries are fitted with Velcro sticky pads as a matter of course, so Pete niftily sticks all the charged batteries on the left wall of the camper van and the flat batteries, due a charge, on the right wall. Simples.

### GERHARD REINSCH RIP

Had a great shock last week. The UK R/C scale and summer show communities were dismayed to learn that lovely Gerhard Reinsch has died. At the moment we have

no other details, so I cannot enlighten you. However, readers will remember his superb large-scale models and his astounding flying skills. For your delight, elsewhere in this issue, I have produced RCM&E's first ever Double Header Model Magic in Gerhard's honour. Keen eyed readers will also remember that Gerhard's astounding models also made fine RCM&E cover shots at least twice.

Gerhard used to come over to fly at our big summer shows and display his large scale, exquisitely finished models. He was an elegant man, very tall, spoke superb English and had a gentle, but impish sense of humour. He had the air of a kindly professor. Kindly and charming, but careful to make sure that Alex got each and every detail written down correctly! He was always incredibly helpful to me when we were doing flying shoots together for the mag. Since he was a cracking pilot, he could position the model in exactly the correct place for the camera, which, of course, meant his well-presented models often made the cover. I remember him giving his huge Eidekker

such an aerial thrashing for my camera at LMA Elvington that I feared for the Fokker's structural integrity. Gerhard just smiled; he well knew his model and her limits.

He was also exceedingly patient with me whenever I emailed him for details to write up the Model Magics on his models. I would describe Gerhard as delightfully 'old school'. He was always courteous and was careful to acknowledge the contribution of others.

Gerhard was fast friends with other Continental radio control 'Scale Greats' like the peerless Paolo Severini and the incomparable Toni Clark (Practical Scale). In fact, Gerhard's much-admired DH 82a Tiger Moth and his magisterial 10 metre span Eidekker were both collaborations with Severini and Clark. It is almost impossible to believe we have lost such an energetic and enthusiastic R/C scale modeller. The sad thing is that last time we spoke, he looked so hale and hearty. Endearingly, like every scale modeller the world over, he was full of plans for his next model.

Fair winds and clear skies, dear Gerhard.



Farewell to Gerhard, a top scale modeller and a lovely man.



# All Write

Get in touch...



Kevin.Crozier@mytimemedia.com



## TOP LETTER

For his letter this month Peter Worthington wins a very popular LiPo and low self-discharge receiver pack combo courtesy of Overlander Batteries - [www.overlander.co.uk](http://www.overlander.co.uk)

### LASER PLYWOOD

I thought I'd share my experience of laser cutting model parts with you.

A retirement gift to myself was a desktop CNC machine with a router attachment. Whilst this arrangement worked well and accurately for cutting out thicker materials, thinner ones were difficult to fix firmly to the machine bed and there was also a major problem in that notches couldn't be cut with the bottom of the cut out square - round cutter bit!

The solution was to raid my modelling budget again and buy a laser attachment for the machine, which would follow the outline completely and accurately - no problem, I thought! From previous experience with laser cutters (albeit higher power, 100W and 60W, versus 3W) working as a Technologist at the local Grammar School, I was comfortable with this option. Indeed, I was able to achieve good results on balsa with no scorching or sooty deposits. That is, it vapourised the material rather than burnt it.

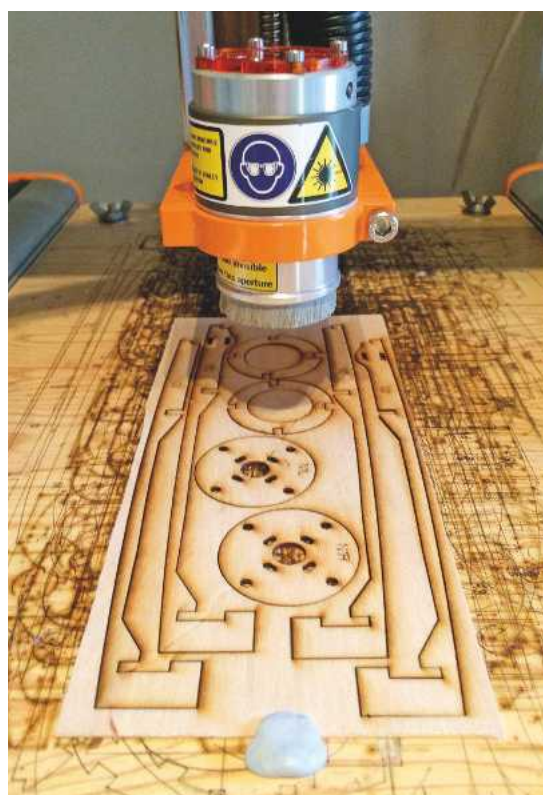
My stocks of ply and lite ply were a different story. I just couldn't get a clean, scorch-free cut regardless of different settings of power, feed rate and number of passes. I realised I'd need laser compatible ply, but could I get laser compatible lite ply? More than in hope than expectation I contacted the company I used to get the school's laser materials, Hobarts Laser Supplies, and eureka! Not only did their laser grade ply perform, they also do laser compatible lite ply, which also performed brilliantly.

Soot? What soot? See attached picture of my efforts.

**Peter Worthington**

*Thanks for the recommendation, Peter. Laser compatible ply is actually not that difficult to obtain and is readily available from companies like SLEC and Sarik Hobbies. But we are happy to add Hobarts to the list.*

**Kevin**



### LOSING MY MARBLES

Those primary school years and the games we played, the fads and crazes. Yo-yo's, soccer cards, charms, snakey and marbles (or 'arlies'). You could tell back then who would be successful in business by the size of their arlie bag.

If I live to be 80 years old and I have a marble for each Saturday in my life, then when I was born back in 1956 there were 4160 marbles in my bucket. Hypothetically each Saturday passed removes a marble and by present calculations I now have about 830 marbles left. Nearly 3300 marbles gone already!

Now, I'm not really one to dwell on statistics and work out permutations of the probabilities of living to a 'ripe old age' but I have realised

again this year, in the midst of this pandemic, just how precious life is, and the value of realising and appreciating the blessings of each day. Having 'lost' my marbles helps me to keep a healthy perspective of the need to make the most of each day and to get on with doing things now because tomorrow might be too late.

From a flying perspective, and now into our fourth month of lockdown, I have been able to get on with a couple of repair projects; when friends used to visit they really must have got the feeling that I can't fly very well, which is the truth.

And each week another marble comes out of the bucket.

This year, more than most, I have been reminded just how fragile and unpredictable life can be. Covid-19, prostate cancer, stress

factors, violence and crime, and our frail economy are all taking their toll. Am I being too generous about the average age that we all might think that we are going to reach? About the marbles left in my bucket?

And so I now resolve to get those planes repaired and fly them again. I resolve to enjoy the good flights to the utmost and not worry about the crosswind. I resolve to put the next silly prang down to experience. In fact I resolve to put the next major catastrophic flying disaster down to experience as well.

We are now into prime flying time, providing that it doesn't rain. What the heck - it's exciting to fly in the rain! It could be another opportunity to have a rebuild.

I think I'm really losing my marbles!

**Greg Yatt, South Africa**



## FOLD THAT PROP

I have just read your article on the Phase 5e powered glider (August issue) and was struck by your comments about the folding prop problem. I had a similar problem recently on a Multiplex Easy Glider that I converted to electric power. I purchased a folding spinner and prop and during installation was a little confused as to the use of a large, thin 'O' ring that was supplied, so I just left it in the box.

After my troubles with the prop not folding, even after ensuring the brake was set on, I did a bit of 'googling' and found someone who had a solution using a rubber band - the penny dropped on the supplied 'O' ring.

It is fitted around one blade at the root then pulled behind the spinner and around the root of the other blade; easier to do than explain in words. Now the blades are held back until power is applied. I must admit I was a bit sceptical, but it works a treat.

The picture attached shows it, although not very clearly.

**Steve Clarke**

*Thanks, Steve, although in the case of the Phase 5e I still believe that the windmilling prop would have been rotating too fast for an O-ring or small rubber band to have had much effect. It's certainly worth doing though once you have a good 'brake' to make sure that the blades don't droop once folded, and I'll certainly be doing so now that I have fitted the 4-Max ESC (see review, p80).*

*Thanks too, to my MSA clubmate, John Freeman for the following tip on where to buy O-ring material.*

**Kevin**



## FOLD THAT PROP 2

We buy 1.6mm nitrile cord, as below, and cyano into a ring. A 1m length goes a long way. Small elastic bands break easy.

[https://simplybearings.co.uk/shop/p83102/1.6mm-Section-NITRILE-70-O-Ring-Cord/product\\_info.html?backstep=1](https://simplybearings.co.uk/shop/p83102/1.6mm-Section-NITRILE-70-O-Ring-Cord/product_info.html?backstep=1)

**John Freeman**

## FOLD THAT PROP - LAST WORD

I note your comments about the windmilling prop on the Phase 5e in the latest mag. I have had this problem with some electric gliders before, and the answer has been to NOT set the ESC prop brake. Seems counter intuitive, but like magic the prop folds and drag is significantly reduced. It works for me - give it a try.

**Dave Burstow**

## SMOOTH AS SILK

Referring back to Danny Fenton's 'Smooth as Silk' offering in the April copy. Many moons ago, when I regularly flew into Bombay and had a few days off there, I bought some sari silk lengths in various colours - red, blue, silver (grey really), yellow etc.

I used it on one Old Timer model, applied with thinned shrinking dope. Sadly, it did not shrink because, as I found out later, it contained some polyester to prevent it from creasing. I overcame this by using the tissue first method, followed by carefully doping on the silk. It worked a treat and is still there, the model coming out for its annual flight powered by an O.S. 40FS.

There is one trouble though, and that is that the colour has faded. But after 35 years how can one go back to the shop in Chor Bazaar and complain? Of course, if it is spray painted it would be more than satisfactory.

I still have several full lengths of the silk left so it is for sale if anyone wants to try it.

**Mike White**

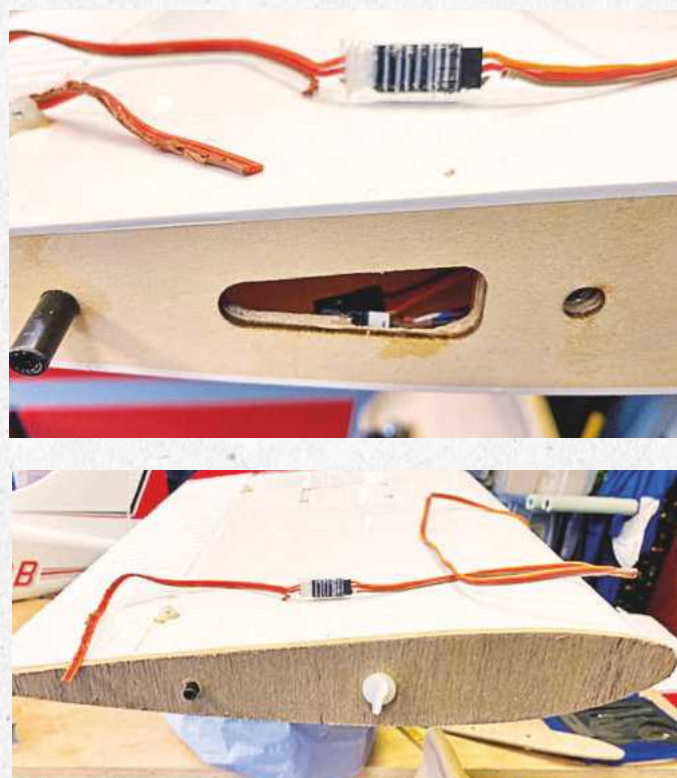
## A MEAL FOR MICKEY

During our enforced lay off from flying I thought I would check over my Hangar 9 Beaver, which has built up wings. Like most modellers the garage is the model hangar. I discovered to my dismay that none of the wing or flap servos worked and mouse damage was the culprit (see picture). They had even had a brief chew of a few wing ribs!

The solution is a ply plate, as per the picture, easily made and totally effective.

I never really wanted to use traps previously but have changed my mind!

**David Trawford**



## SIMPLE STORAGE CHARGE

Storage charge? There is a simple and quick way.

Take any model that uses the battery you want to discharge and strap it to your work bench. Connect the LiPo without putting it in the model, or at least with the balance lead hanging out so your voltage checker can be connected.

Turn on the radio and run at half power for two minutes and check cell voltages. Repeat until the storage charge is reached. Obviously, point the model at the wall and stay behind the model at all times. Cost is zero and each cell is brought to a storage charge within ten minutes.

Simplest!

**Cliff Whittaker**

Well, Cliff, it certainly doesn't get any simpler than that! Just to be on the safe side it makes sense to make sure that any pets or children are kept well away from any spinning props. And I'd be a bit wary about too much heat building up inside the fuselage; even with good cooling some models need the forced air from flying to make sure that the motor and ESC do not overheat. Lastly, powering up any model at home, electric or IC, can be a bit antisocial, especially if you have any neighbours close by. Doing so for several minutes could be the end of a beautiful friendship!

Chargers with storage functions are relatively cheap these days, and even cheaper second-hand for an older unit, so I'd still recommend this as the way to go for any aspiring electric pilot. And it should balance your cells too, which a free running motor cannot do - **Kevin**



# MARVELLOUS MILLS

I've only ever built two models since returning to modelling in 2007, when I took early retirement, one being a Tomboy to accommodate a gift of a lovely old Mills .75. I like looking at the plans and dreaming, still, of a workshop like others have the luxury of and to build again as we did as kids. The Tomboy, by the way, is my only dabble with IC, but I just love the smell of diesel. I'm allergic to glow fuel!

I was gifted the beautiful .75 Mills you see in the picture, together with all the original paperwork and the overhaul paperwork, which is dated 1951, three years before I was born! There was also a small envelope containing many spare parts and the mounting bolts, etc. Apparently, it hadn't been run since it was returned to the original owner and his niece asked if I could find a home for it. Primed with fuel, it started after just three or four flicks and has run sweetly ever since.

**Geoff Reynolds**



# PRAISE FOR PICASIM

I read John Stennard's article on simulators with interest. RealFlight is certainly good but anyone who is thinking of getting a simulator should also have a look at PicaSim. For glider flying it is widely agreed to be the best and it does powered planes as well. It runs on Windows, Android and Linux (with Wine), doesn't require a fast machine - and it is free.

**Andrew Horne**

# ACETATE SHEET

Where to find acetate sheet? Just buy lamination sheets, A4 size. You can get 50 sheets for just over £2.50. Pass them through a laminator on hot and you'll get perfectly clear sheets that cut easily and which are pliable. You can use them for making canopies and also LED covers for wing tip lights. Have a go and you will be amazed how versatile these sheets are when laminated.

**Les, Thetford**



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# GOING PLACES

Diary dates for the coming season

## SEPTEMBER 2020

### September 19-20

**ModelAir Festival of Flight** at Old Warden Aerodrome, near Biggleswade SG18 9EP. For lovers of model flying, pilots and spectators alike, ModelAir Festival of Flight offers the chance to enjoy radio control (10kg max weight and B-Cert), free flight and control line flying on one site. All pilots must show BMFA Insurance. Various competitions on Sunday. Gates open 9am. Flying 10am-5pm. Tickets: BMFA Members £8.50, SVAS Members £8.50, Spectators £13 (no concessions), Children free. Please have membership card ready to show at the gate. All tickets include the Museum Collection and Swiss Garden. Camping on site: £12 advance booking: [camping@shuttleworth.org](mailto:camping@shuttleworth.org) or 07538 485843. Trade Line, Car-boot, Restaurant, Jubilee Playground. Traders/Car-boot please contact [modelair.oldwarden@gmail.com](mailto:modelair.oldwarden@gmail.com) For more information: [www.modelair.info](http://www.modelair.info) and [www.facebook.com/ModelairAtOldWarden](http://www.facebook.com/ModelairAtOldWarden) or contact Sheila 07799 132999. Please note that currently Shuttleworth plan to go ahead with all their events unless advised otherwise by government guidelines. Please check before travelling.

### September 19-20

**GBRCAA Championships.** BMFA Team Selection and National League. All schedules. BMFA Buckminster. Visitors very welcome. See [gbrcaa.org](http://gbrcaa.org) and 'forum' 'Competition News' or contact CD Matt Hoyland on 07739 840498 for more details.

### September 26-27

**Hastings MFC Autumn Fly-in and Swapmeet.** Open to all BMFA and LMA members. 26th/27th September. For a longer stay, camp and fly on our site off the A259 at Middle Bridge near Pevensey from 23rd September to 2nd October, £10 for the week (subject to ground conditions). To fly pilots must have minimum A-cert, and B-cert for models over 7kg and turbines. Free open air Swapmeet on the Sunday. Bring your own table. To book camping or swapmeet phone Kevin on 01323 849032. All other inquiries phone Bob on 01892 852137.

### September 25, 26 & 27

**Lleyn Model Aero Club Bring & Fly** at Pen-y-Berth, Pwllheli, North Wales. All types of flying welcome from our fantastic power site to some of the most amazing slope sites in the country. Camping and caravanning on the adjacent site complete with cafe/bar where most meet in the evenings. Why not do what a lot of others do and make it a week or more to enjoy the flying sites and surrounding area? We have on-site catering for a bacon buttie and brew amongst other refreshments; you can even order your butties to be delivered to the slopes. Please note for safety purposes there will be a pilots' briefing each morning at 9.30am on the power field to discuss flying and the slope of the day. This is where registration takes place. For further info please contact Frank on 07867 361905 or visit [lleynmac.org.uk](http://lleynmac.org.uk)

## OCTOBER 2020

### October 3

**UK Classic Aerobatic Association Fly-in** at Loughborough MFC, Northants. This is a Saturday Fly-in and 1-round contest to UKCAA Pick5, Pick7 and 1979 schedules. Visitors welcome but pre-registration is required at [ukcaa.org.uk/events](http://ukcaa.org.uk/events). Contact Martyn Kinder on 079890 25198 or email [ukcaa2013@gmail.com](mailto:ukcaa2013@gmail.com)

### October 4

**GBRCAA F3A National League** competition, Hurley, Warwickshire. All schedules. See [gbrcaa.org](http://gbrcaa.org) 'Competition Entry Form' for fees and payment and 'forum' 'Competition News' for details. Visitors welcome but please contact Contest Director, Adrian Harrison on 07976 244004 for details.

## NOTICE:

Due to the continued effects of the Coronavirus we recommend that you check with the organisers before travelling to any of these events in case of last-minute changes or cancellation.

### October 4

**Wessex Soaring Association Slope Fly-In**, first Saturday or Sunday of the month. Various slopes approx. five miles east of Shaftesbury. Non-powered gliders and e-soarers permitted. All welcome but must have BMFA insurance. Contact Pete Carpenter for more details, email [pete.carpenter12@gmail.com](mailto:pete.carpenter12@gmail.com) or call 07919 903742.

### October 10

**Delyn MFC Swapmeet** at St. Winefrides Primary School, Holywell, CH8 7NJ, North Wales. Contact John Beck on 07974 212035 or visit [delynmfc.bmfa.org](http://delynmfc.bmfa.org)

### October 11

**Beverley and District Model Aircraft Club Spring Swapmeet** at Tickton Village Hall, Tickton, near Beverley, HU17 9RZ. From 9am till 12 noon. Entry £1, tables £5. Contact Brian Jenkins, via 2bee.jays@live.com, call 07970 959875 or visit [www.badmac.btck.co.uk](http://www.badmac.btck.co.uk)

### October 16-18

**Weston Park International Model Airshow** at West-under-Lizard, Shifnal, Shropshire, TF11 8LE. Fantastic trade support, top display pilots from around the world, three days of non-stop flying, pyrotechnics display and Sunday/Saturday evening night show. On-site camping from Thursday till Monday. Full size displays all three days, evening entertainment Friday and Saturday. Helifest and quad fair, swap meet, plus cars, boats and much more. Something for all the family. Contact Steve Bishop for more info on 01952 587298 or 07758 895068. [www.westonparkmodelairshow.co.uk](http://www.westonparkmodelairshow.co.uk)

### October 24

**Jacobs Well Swapmeet** at Jacobs Well Village Hall, Jacobs Well Rd, Guildford, GU4 7PD. Hall opens for sellers 8:15am, start time 9am. Tables must be booked in advance. Tables £7 each to include one entry. Buyers £2 per person. Please contact Martin Thompson on 07401914341 or email [jacobswellswapmeet@hotmail.com](mailto:jacobswellswapmeet@hotmail.com)

## NOVEMBER 2020

### November 1

**Wessex Soaring Association Slope Fly-In**, first Saturday or Sunday of the month. Various slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers permitted. All welcome but must have BMFA insurance. Contact Pete Carpenter for more details at [pete.carpenter12@gmail.com](mailto:pete.carpenter12@gmail.com) or call 07919 903742.

### November 17

**Southend Radio Flying Club Tabletop Sale** at The Ecko Club, Thornford Gardens, Southend-on-Sea, Essex, SS2 6PU. From 8pm till 10pm. Entry £2, tables £4 including entry. Please book tables in advance with Den on 07745 2219443, or Les on 07729 421939.

## DECEMBER 2020

### December 6

**Wessex Soaring Association Slope Fly-In**, first Saturday or Sunday of the month. Various slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers permitted. All welcome but must have BMFA insurance. Contact Pete Carpenter for more details at [pete.carpenter12@gmail.com](mailto:pete.carpenter12@gmail.com) or call 07919 903742.

## MARCH 2021

### March 14

**Horam Swapmeet** at Horam Village Hall, Horam, East Sussex, TN21 0JE. Hall open for sellers at 8:15am. Start time 9am. Tables must be booked in advance. Tables £7 each to include one entry. Buyers £3 per person. Please contact Martin Thompson on 07401 914341 or email [horamswapmeet@hotmail.com](mailto:horamswapmeet@hotmail.com)



For more events go to [modelflying.co.uk](http://modelflying.co.uk)



# COUNTERPOINT



## NANCHANG CJ-6 V2

£269.99 | [www.cmldistribution.co.uk](http://www.cmldistribution.co.uk)

If you're looking for something scale-like with which to learn the ropes of basic aerobatics then how about the latest helping from FMS, a scaled down 42.9" (1200mm) span version of the Nanchang CJ-6? Renowned for its predictable flight characteristics, aerobatic capabilities and rugged dependability the full-size is certainly proven, having served as a basic trainer for the PLAAF since 1958.

Beautifully finished in the PLAAF demonstration team scheme and accented by bright LED navigation lights, the model's carbon reinforced, split flap-equipped EPO airframe is lightweight and robust. Complemented by a strong set of electric retracts it's capable of withstanding the rough-and-tumble of training duty. Supplied complete with a 3541-840kV motor, 11" x 8" three-blade prop and 40A ESC, you'll need 6-channel R/C (aileron, elevator, rudder, flaps, retracts, throttle) and a 25C 2200mAh 3S LiPo.

## SONIK RC F4U CORSAIR 400

£TBA | [www.jperkins.com](http://www.jperkins.com)

Joining the expanding Sonik RC fighter group, this four function F4U Corsair 400 from J.Perkins is beautifully solid in the air and both looks and flies every bit as well as a far larger

model, even in a stiff breeze. Equipped with a finely tuned, switchable six-axis gyro stabilisation system this little model shrugs off turbulence, offering an all-season performance. Offered at a pocket money price ready to fly and with everything included in the box, this versatile warbird is perfect for both indoor (large sports hall) and outdoor (small field) flying.

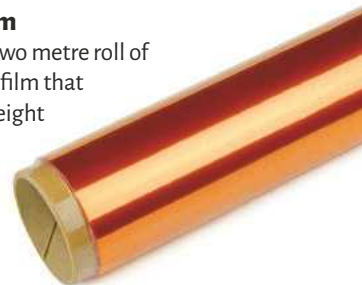


Spanning a suitcase friendly 15.75" (400mm) and supplied with a four-channel 2.4GHz Tx, 1S LiPo, USB charger, demountable U/C and spare propeller, the only extra you need to buy is a pack of 4 x AA batteries for the Tx. Get one, fly from home and never be far from your R/C fix.

## ORALIGHT TRANSPARENT ORANGE

£20.50 / [www.jperkins.com](http://www.jperkins.com)

Weighing just 36g/sq.m. this two metre roll of Oralight is a premier covering film that can reduce overall airframe weight without compromising the quality of your covering medium or complicating the application process. Rich and vibrant in colour, Transparent Orange Oralight shares the unique qualities of Oracover in that it allows you to re-position without fear of colour layer separation whilst being tough, fuel resistant, highly adhesive and able to tolerate temperatures of up to 250°C without the worry of bubbles, sagging or colour bleed.



## VENTUS-3

€2999 - €5899 | [www.composite-rc-gliders.com](http://www.composite-rc-gliders.com)

This lovely 15.7ft. (4.78m) span, 1:3.75 scale sailplane simply oozes class. Built to a very high standard with a fibreglass / carbon / aramid fuselage and carbon shell wings and tail surfaces that afford the airframe a promise of high durability, this 16.8lb (7.6kg) soarer brings premium performance to your fingertips. Flap and airbrake-equipped, the Ventus comes complete with pre-installed landing gear, glued and painted canopy and servo covers, and is available in a variety of completion levels - standard kit, fully built and ready to fly. There are electric options, too. For 6+ channel R/C and eight servos, this is a real beauty - check out Composite's website for more information.







# PACK, STACK & RACK

Shaun Garrity takes advantage of the lockdown to have a clear out and uses some rediscovered plumbing parts to make some model racks

words & photos » Shaun Garrity

**L**ock down has actually had a number of benefits in the Garrity household. With all this time spent inside the home, I had finally run out of excuses for all those jobs I've been repeatedly putting to the back of the queue for far longer than I would care to admit. One biggie was the loft; when we moved into our current home, I made the mistake of boarding the floor, then plaster boarding the walls and ceiling to make a large, dust free storage space with a semblance of temperature control. Strangely, I then decided to carpet the floors - I can only assume I banged my head on one of the roof

joists as it seemed like a good idea at the time! Twenty years on it was now loaded to the gunnels with stuff - out of sight, out of mind, as the saying goes. Quite how these many kilograms of past treasures (mostly junk) never joined us in the room below, by coming through the ceiling, is truly amazing. It was time for the clear out I had been promising my dear wife for years.

## THE BASICS

As a starting strategy, I decided a primary run through into three piles of Keep, Not Sure and Chuck would be prudent. It was quickly

obvious that a skip was going to be required, but a slight problem reared its head due to lockdown as permits were not being issued for putting a skip on the road outside. Never mind, this was a first world problem that could easily be overcome, so I just moved the bagged-up junk from the loft and relocated it into a spare bedroom until such a time that the necessary paperwork could be arranged for the skip. During the sorting and clearing process, what was a tad worrying was this 'out of sight, out of mind' philosophy clearly doesn't work for me as I was finding multiple, identical items, such as two Veron Big Eagles, two Veron Veloxes and two Veron Sopwith 1 1/2 Strutter kits - oops, wasting money again! As I buy kits to build (eventually) and not to collect, the duplicates will be soon making an appearance on a selling site so other modellers can fill up their lofts with these cherished reminders of days gone past.

The ten mobile phones, including fixed in-car and portable versions with batteries the size of house bricks, are going for recycling, as is the huge box of audio/visual cables, dead laptops, printers, a fax machine and even some modems (remember them and their incessant beeping and squealing?) Oh dear, I'm starting to sound like a serial hoarder.

During this voyage of discovery, I also unearthed a few lengths of PVC overflow pipe, elbows and T-pieces. Looking at the pile of wings and fuselages that I also had stored up in the loft, an idea came to mind - build some racking. After a few tentative sketches I decided winging it was the way forward, so a quick measure up, with a lot of guess work, and I had a parts list. A trip down to the local plumbers' merchant saw me ready to get cutting and gluing.



*A visit to the Plumbers' Merchants resulted in this little lot. Guess work was involved for the quantities but it wasn't expensive.*





*At around £5.00 this pipe cutter is a great buy and makes the job much easier. You mustn't use them like scissors but squeeze and rotate around the pipe to cut it.*



*The adhesive comes with a handy brush in the lid. As this is solvent based use it in a well-ventilated area and keep the lid on, otherwise you may start seeing magic elves and pixies!*



*Dry fitting the parts first should eliminate any problems. The joints won't come apart once glued.*

### BUDGET BESPOKE RACKING

The racks are surprisingly cheap to make with the T-pieces and 90-degree elbows costing around 60p each, tubing (21.5mm) around 50p per metre and a tin of glue at £4.00. One widget definitely worth buying for around a fiver was the pipe cutter; it's far easier than having to hacksaw each piece to size, then chamfering the edges off.

To start with I decided to make one rack for wings and another for fuselages, intending to fit them under some shelving in another loft; we have a lot of loft space, as we live in a bungalow. Once you have established the size, start by building the basic frame. I added additional struts to stop any flexing that may occur when loaded up with models, but there's no need to make it absolutely rigid. As you'll see from the accompanying images the designs varied with no definitive shape. You don't have a lot of time to move things around once the solvent glue is applied, so I would suggest a dry run first to make sure everything lines up because once glued the only way to remove a Tee or Elbow is with a saw, or the pipe cutter. If you work on the end panels first, assembling



*I made three racks, each differing a little in design. All are sturdy enough for their intended purpose.*

them on the work bench will ensure they are not twisted. Once the glued pipe has been inserted into the fitting don't forget to wipe off any excess glue that may have oozed out.

Most of my wings are stored in bubble wrap bags but to protect the fuselages I bought some thin 22mm pipe lagging to slide over the tubes to protect them. These racks will definitely maximise storage space; I managed to get eight fuselages into the space where I



*Foam pipe lagging, slid over the tube, will prevent any potential damage to wings and fuselage when in use.*

previously stored three - a great result!

Was it worth it? Most definitely, with the racks working out around £10.00 pounds each. Wood could have been used as an alternative, but the plastic tubing is so easy to work with, light weight and each rack can be made in less than 10 minutes.

I'm not claiming any originality for this racking system and I'm sure it's been done before, but why didn't I think of this years ago! ✈️



*The first rack I made was for wings and it can be slid out from under the shelf to give access.*



*This rack proved to be a very efficient space saver. Previously, just three fuselages took up the same space.*



# PUTTING THE BRAKE ON

Kevin Crozier fits a new ESC to stop a windmilling prop

words & photos » Kevin Crozier

In my recent Phase 5e review (August issue) I reported how I was having difficulty in completely stopping the folding prop in flight. It is about the only negative trait of an otherwise very capable model; sure, there are one or two niggles in any build, but that darned spinning prop haunted me every time the Phase 5e took to the sky. Ripmax were very helpful and promised to look into providing a programming card for their Quantum 60 ESC, which I was very happy with in all other respects.

Just to recap, this ESC, as supplied, relies on responding to a series of beeps if you want to change the set up. It works very well straight from the packet but try as I might I could not get it to brake properly.

## FEELERS OUT

While I was waiting for Ripmax to get back to me, I decided to put out a few feelers to see if anyone had a suitable programming card. My first port of call was George Worley at 4-Max ([www.4-max.co.uk](http://www.4-max.co.uk))

George told me that it was unlikely that his programming card would work as each manufacturer had their own version, but I was welcome to try. Within a day or two a slim package popped through my letterbox, which to my surprise not only included a 4-Max ESC Programming Card but a matching 60A ESC too! George had even pre-programmed the brake function for me.



*The 4-Max ESC is actually a bit smaller than the original, so pops into the nose easily.*

I quickly read the instructions on the back of the Programming Card and connected up the Quantum ESC, together with a LiPo. As predicted by George, nothing happened.

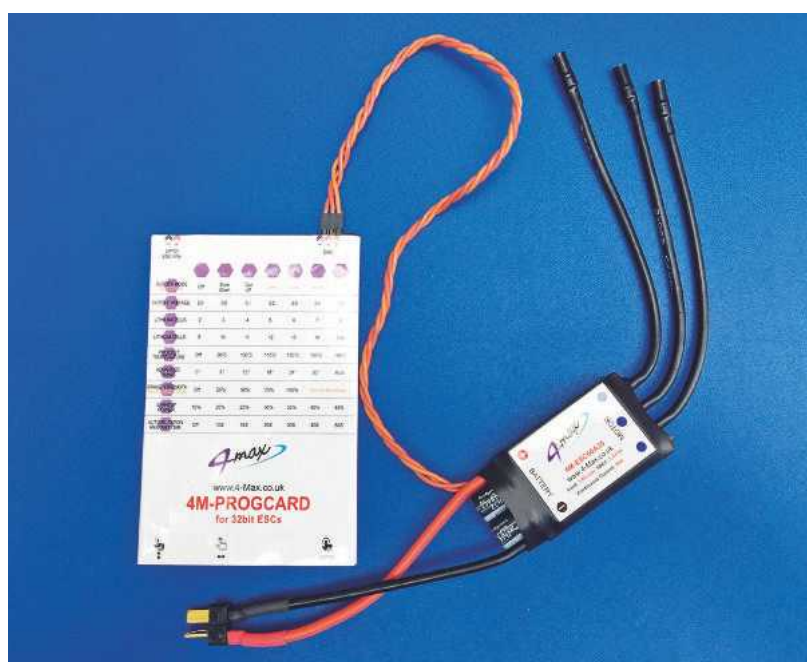
My attention turned to the new 60A ESC, which just needed a matching connector to be soldered on. The Phase 5e set up uses Deans

connectors; not my favourite type, but they are polarised and all my 4S 3200mAh packs are fitted with them. So, I delved into my spare connector stock and came up with a shiny new Deans plug, which was soon attached.

When doing this be sure to cut off the tinned ends of the wires and re-tin them using



*Neatly laid out Programming Card. So much easier to use than those beeps!*



*4-Max ESC connects to the Programming Card via the throttle lead.*



## Please set parameters as below:

- 1: Connect ESC signal cable with programming card "+" interface.
- 2: Power on ESC, row LED lights and line LED light on means ESC and programming card has been connected successfully.
- 3: If not connect successfully, please power on and connect again.
- 4: If ESC connected with motor, motor will beep after connecting OK.
- 5: After ESC and programming card connecting successfully, you can set all the parameters.
- 6: Up and down button to select each item, left and right button to select detail parameters, Enter button to confirm the setting.



Clear instructions are printed on the back of the card so you can't forget them!

fresh leaded solder, then use the same solder for attaching the connector. This is because although the more environmentally friendly non-leaded solder used to make modern electronic equipment works well on factory production lines it is harder to use competently when hand soldering. For occasional use you will get a far better and safer solder joint by using leaded solder.

Whilst no battery connector is provided, it's a different matter at the motor end, the three wires being capped with neatly heat shrunk 3.5mm connectors. However, the Quantum II 36 motor is fitted with 4mm connectors, so the smaller connectors were cut off and replaced with new ones of the correct size. In truth there's really no need to do this as 4-Max can supply the 60A ESC with 4mm motor connectors, so do make sure that you order the correct type (4M-ESC60A40) for the connectors fitted to your own motor. If it comes with 3.5mm connectors, then 4M-ESC60A35 is the ESC you want. Both versions cost £44.95 plus P&P. I set my ESC according to George's comprehensive instructions, which you can read here: [www.4-max.co.uk/pdf/4M-ESC%20Programming%20Instructions.pdf](http://www.4-max.co.uk/pdf/4M-ESC%20Programming%20Instructions.pdf)

This time, plugging everything in as per the diagram on the back of the card caused it to light up, so we were in business...

### CARD READER

The 4-Max 4M-PROG CARD is suitable for use with any 4-Max 32-bit ESC. It costs just £9.50 so is well worth adding to your order if you purchase one of George's ESC's as it makes checking the set up so much easier than having to waggle the throttle stick and respond to any beeps.



Indicator LEDs show up well. Read down for the function being set and then across to show the value.

Using the Up/Down button at the base of the card allows you to scroll through the various functions, which are:

Cut-off Mode/Battery Type (LiHV, LiPo or NiMH)  
Cut-off Voltage  
Number of Lithium Cells (2 - 14, or just use Auto)  
Protect Temperature  
Advanced Timing  
Brake Strength/Motor Direction  
Start Up Power (10% - 45%)  
Auto Rotation Restart Time (for helicopter use)

Pressing the Left/Right button, also at the base of the card, allows you to change the parameter for each function, which is confirmed by pressing the Enter button alongside.

In practice the buttons are quick and easy to use, and the lights are clear and strong, which will make using the card easy if you put it in your flight box and want to make any changes at the flying field, even on a sunny day. The card is very slim too, about half the width of a modern smartphone, so it won't take up a lot of space.

### MAKING CHANGES

As you can see from the nearby picture, the ESC was supplied with the Brake Strength set to 100% (reading across to the column highlighted by the LED in the top row). At this setting there's no doubt at all that the motor is braking as it snaps off very smartly indeed. I was even tempted to turn it down a bit but decided to give it a flight test first.

Start-up Power was initially set to 45% but since I solo hand launch this model it helps if the power comes on less forcibly, so I dropped it to 35% so that the prop spins up more slowly, giving my launching hand more chance to get used to the torque as the motor powers up. I left the other settings as provided.

### FLIGHT TEST

Well, what an improvement! After the Phase 5e's usual impressive climb out the prop blades now stop with great authority, with no windmilling to spoil the glide performance.

I can't say that it has actually increased the soaring capability of this fine model too much, but it makes me happy to know that those blades have finally stopped spinning once and for all. Thumbs up, 4-Max! 🛩️



4-Max's 60A ESC can be supplied with 3.5 or 4mm motor connectors. You'll need the 4mm version for Ripmax's Quantum II 36 motor.



# THE INFINITY

With the Infinity Evo's carbon airframe fully finished, Kevin Crozier heads for the local gliding field

words » Kevin Crozier | photos » John Freeman

It's been a long while since I had such a large investment in a model aeroplane so the night before the Evo's first flying session was a bit long and fidgety. Normally I am not too fazed by the first flights of a model and it's been decades since I last asked someone to test fly a new model for me. But flying such a large, all-moulded thermal soarer such as this one was new territory for me, so I had no qualms in handing it over to someone with proven experience in flying such an aircraft. Luckily for me, Neil Jones of Flighttech, who imports this and other high-performance gliders, lives nearby so we arranged to meet up for the next available soaring session with the Malvern Soaring Association at their huge flying field, just over the river from Upton-upon-Severn.

Soon after arrival, Neil phoned to say that he was running late, which did my frayed nerves no good at all. My thanks go to John Freeman, who helped me take my mind off things by assisting me with a range check, which proved no problem at all for my new PowerBox Core radio system. The other MSA guys present also stepped in, helping fit a small rubber band over the model's folding prop hub to make sure that the blades closed fully when gliding, hence reducing drag to the bare minimum.

They also warned me of the dangers of leaving the large, black carbon aircraft to bake in the sun. After just a few minutes the wings were noticeably hot to the touch, so it's standard procedure to cover the airframe up with the reflective wing bags provided. I've also taken to laying the fuselage bag over model's long, slim body between flights for the same reason. The tailplane halves, being bright yellow, do not suffer from heat soak to the same degree, but I cover them anyway just to be on the safe side.

Eventually Neil arrived and after a short examination of the Evo he expressed his satisfaction. Club Chairman, Steve, was press-ganged for launching duties and the three of us strode out into the long grass for some power-off trimming lobs and the first flight proper. With a nod from Neil, Steve gave the big glider a firm and level launch, following which the model followed a pendulous flightpath for a few seconds as Neil adjusted the elevator trim, before coming to rest amongst the long, green stalks. A second test glide followed, this one being much flatter as Neil got closer to the correct trim, and then it was time to launch her skywards for her true maiden flight.

Following a moderately steep climb for a couple of seconds, Neil cut the power and levelled the Evo out, before almost immediately flicking her into a tight thermal turn. It was quickly apparent that she was in a nice bubble of low-level lift and Neil worked it like the pro that he is as the sleek glider worked its way back to the launch area.

A couple of short power runs followed, each time resulting in the Evo catching a wayward bubble of lift, before Neil announced that he was very happy with the way she was flying -



*This sleek soarer impresses me every time I fly her. There's lots of untapped performance to come.*

albeit in novice trim for a newbie F5j pilot like me - and promptly handed me the transmitter.

I covered a taste of what followed in my Welcome introduction in the last issue, so I won't repeat it here. Suffice to say that all went very well until the time came to power her up, which is when my mind blanked with the new transmitter layout I was trying to use, with flaps on the throttle stick, a set up that is widely favoured by glider pilots.

The gyrations that followed were caused by me pulling the huge flaps instead of engaging the throttle, compounded by the fact that when I copied my original set up (with throttle on the main stick and flaps on a slider), the large degree of down elevator compensation that Neil had recommended had, for some reason, not copied across. So, when I inadvertently activated the flaps instead of the power switch, the huge flaps came in with a vengeance but with no down elevator compensation to mollify their effect. The result was an impressive bunt, straight from



# PROJECT PART 4

“...flying such a large, all-moulded thermal soarer such as this one was new territory for me”

the glide! Fortunately, being cautious I had decided to make my first climb out with height to spare, so apart from an embarrassing display of unintended aerobatics, I was able to sort things out and then find the actual power switch. Phew!

Power off and in the glide it all felt very natural and I found the Evo to be surprisingly easy to fly, happily encountering my own small areas of lift, before handing the model back to Neil for landing. He had noticed the alarming lack of flap/elevator compensation, so he skilfully avoided touching the flap (ex-throttle) stick and brought the Evo in for a long but trouble-free landing.

## LUNCH BREAK

Whilst the MSA chaps enjoyed their lunch break, I delved into the Core's programming and that's when I discovered that the flap/elevator mix was missing. Thankfully the Core is very easy to program so it was the work of just a few seconds to get things working properly. As I told you last time, I stupidly did the same thing on the second flight (activating flaps instead of throttle) but this time, thanks to the down elevator compensation the Evo just settled into a steep but slow downward trajectory, instead of rotating, so I had plenty of time to recognise my mistake and clean her up before finding the power switch.

The rest of the flight followed without incidence and I was able to settle down to enjoy the so far un-tapped but excellent soaring performance of my fabulous new glider.

## BATTERY PACK

One thing I should mention is the duration of the small (very, to my eyes) 3S 1000mAh LiPo. A pack like this is park fly territory for me, so I was a bit apprehensive about it being able to support many climb-outs and still keep the all-important radio supplied with sufficient power. The MSA boys assured me that such small packs were capable of at least four good climbs to height, with long periods of gliding in-between, and so it turned out. Such is the performance of high-quality gliders like the Infinity Evo that the soaring segments can last for some time, even in a novice's hands like mine, so one of those small LiPo packs is quite capable of the task required. I invested in three packs and have found that three long flights are usually more than enough to fill a full session of relaxed thermal soaring.



*Ideal conditions for the first flights, with a soft landing assured in all that long greenery!*

## SET UP CHANGE

For the final flight on the Evo's first outing I changed back to my original 'power flier' set up, with the throttle back on the left stick and the flaps operated by a side mounted lever, as per my normal practice. After two scares I wasn't prepared to take any more risks with an unfamiliar Tx format. This flight was much more pleasant for me, with all the controls back in their familiar places, so I could stop worrying about the set-up and start enjoying exploring the Evo's flight envelope. One thing I have noticed about flying with

the MSA is that they don't go in for long climb-outs, heading skywards until their gliders are small specks in the sky - that's what thermals are for! Instead they use bursts of just a few seconds to climb to a moderate altitude and then they explore the air, exploiting any areas of lift that pass through. The still air performance of a high-performance glider like the Infinity Evo is such that it doesn't lose much height at all when simply cruising, but when it does hit a pocket of lift it sure lets you know about it, lifting a wing or simply rising up noticeably in



*Evo gets a well-practiced launch from club Chairman, Steve.*



“...in the glide it all felt very natural and I found the Evo to be surprisingly easy to fly”

the warm air. Even with my short time with the Evo, I was able to make use of a series of weak thermals to prolong my glides between climb-outs, the impressive model making life easy for me as I kept her rotating back towards the launch area.

I soon noticed that the best pilots were happy to keep thermalling quite a way downwind, well past the distance that I would previously have felt comfortable with using my older gliders. With such good cruise capabilities they can do this, happy in the knowledge that just by simply heading for the field with a little bit of extra speed they can return their expensive gliders home with practically no risk. That's a skill that I'm going to have to develop, but for now I was happy to stop turning within the field boundary before powering up for another thermal hunt. When flying upwind Neil also urged me to fly in a particular direction. When I quizzed him about this, I discovered that he had been watching the trees beside the riverbank and when they stopped moving, he knew a thermal was passing through, so it was just a matter of heading over there and waiting for the magic to happen!

### GONE SOLO

Since that glorious day I have enjoyed some excellent thermal hunting sorties with the Infinity Evo. It's still early days and I'm discovering more about unleashing the model's undoubted hidden performance, especially now that I'm unhindered by worrying about the Tx configuration.

Despite the model's size it has proven quite easy to solo hand launch. Thanks to the slim



*Just a few seconds of power gets her to thermal hunting height.*



*Infinity Evo in her element, maximising any lift that passes by.*

fuselage you can grip it like a javelin just forward of the wing. And even though the balance point is well behind your hand, thanks to the Evo's light weight you don't feel like you are going to drop the tail.

Besides the impressive thermalling capability I also marvel at the power of those huge flaps. Even without any crow assistance from the ailerons, when fully deployed they are quite capable of literally stopping the model in mid-air so they have to be used with

caution; to be honest I prefer to keep to mid-flap, which slows the model nicely in preparation for landing but still retaining a moderate glide angle. When full flap is deployed the angle of descent is very steep and it's easy to raise them too quickly, allowing the glider to balloon up just before landing. Yes, I know I would have finer control with them on the throttle stick, but each to their own.

I have also realised that sometimes I may be flying the Evo too slowly and not making best use of her specialist wing section. This was brought home to me when Neil turned up with his own Infinity Evo and I watched, mesmerised, as he hooked up a thermal, but with the model flying noticeably faster than mine. I'll need to watch out for not applying too much up elevator when thermalling in the future. As with the other MSA guys, Neil kept hunting that thermal well downwind, but even more so and in the end all I could see was flashes of orange from the outer wing panels as it became a speck in the sky. Eventually even Neil had had enough and he turned the Evo for home, scooting across the sky at quite some speed. This flight alone was sufficient to prove to me the hidden potential of my own Infinity Evo - I just need to practice, practice, practice! ✈️



*The built-in down-thrust of the fuselage and the white underwing bands are well illustrated in this shot.*

“I just need to practice, practice, practice!”

## DATAFILE

|                      |                                                                              |
|----------------------|------------------------------------------------------------------------------|
| <b>Name:</b>         | Infinity Evo V-tail                                                          |
| <b>Model type:</b>   | F5j class electric glider                                                    |
| <b>UK importer:</b>  | Flighttech<br><a href="http://www.flighttech.co.uk">www.flighttech.co.uk</a> |
| <b>RRP:</b>          | £1450.00                                                                     |
| <b>Length:</b>       | 697mm                                                                        |
| <b>Wingspan:</b>     | 3500mm                                                                       |
| <b>Aspect ratio:</b> | 16.4                                                                         |
| <b>Airfoil:</b>      | Dirk Pflug special                                                           |
| <b>Wing area:</b>    | 74.6 dm. sq.                                                                 |
| <b>V-tail area:</b>  | 7.52 dm. sq.                                                                 |
| <b>Functions:</b>    | Ailerons (2), flaps (2),<br>rudder (1), elevator (1)                         |



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*Another perfect day in the Peak District. Rushup Edge is one of my favourite places, with euphoric flying on the right day.*



# READY FOR THE SLOPE

Simon Cocker reveals a sampling of some of the projects created during the C19 lockdown period

words & photos » Simon Cocker

**T**here was an uncertain irony that much of the time we were confined to quarters due to the restrictions imposed to contain the pandemic the weather was mostly perfect to be outdoors pursuing our wonderful sport of model aircraft flying.

While the frustration of not using the ongoing weather windows was contained many of us redirected our creative energy to put this unexpected time to productive use. I was clambering up the walls of my workshop at first but disciplined myself to put in the hours each day until the process became a daily routine. This habit quickly became a therapy which has served to guide me through this challenging first phase of this unprecedented global disaster. I pray the vaccine arrives very soon so that repairs to our worldwide economy can be undertaken in earnest.

There is now evidence of new airframes from many of my modelling friends that have



*Andy Schafer Graphics have personalised this Multiplex ASH-26. Kontronik drive system on 4S provides easy ascension from a hand launch.*





*Multiplex models have been used all through the calm summer evenings. Cularis just finished and flown for the first time.*

emerged from the balsa dust storm of frenetic activity and chaos. I have also brought along a number of projects that had stalled due to lack of focus and foresight, completed a couple of kits that should have been a quick build but became sidelined, and then indulged in a refurbishment of an ancient Multiplex DG-300 and Pat Teakle ASW-20.

I also acquired an old Multiplex ASH-26 and Cularis kit, both untouched and in perfect condition. I could not resist it and put them both together in between other projects; as you know by now everything has to have FES these days. The ASH-26 was ready in a week and has been really useful on those light summer evening breezes on the slope. I just love all the Multiplex products.

#### **BAUER MODELL FS25**

I also enjoyed the build of a Bauer Modell FS25, which had been lost to the world in a loft in Shropshire since the eighties. This project has taken months and months of my time, in complete contrast with the ASH-26. I almost did not want to finish the model as I was enjoying the process so much - that is a

first for me. Apparently, this is to do with attachment issues and that I will be afraid to fly it when the time comes, and I can feel that to a degree.

This 4.14m span kit languished in the bowels of my workshop for the next six years, as did a number of further projects acquired for when I found a lull in my building programme. In their day Bauer were at the top of sailplane scene; they offered an extensive range of high-quality models, including some powered aircraft. Their epoxy fuselages and exquisitely finished wings set a new bar for German kit manufacturing at that time.

The wing skins were made using lovely hard balsa sheet and this was all applied with epoxy and fine glass fibre cloth in a press to the high-density white foam cores to provide an accurate wing profile that remained firmly attached and unwarped through the decades of storage. I was truly amazed to find the semi-scale model in perfect shape, and with a set of single paddle airbrakes neatly fitted too. The bare yellow epoxy fuselage had picked up a cocked fin angle, which required some surgery as it was off by around seven degrees



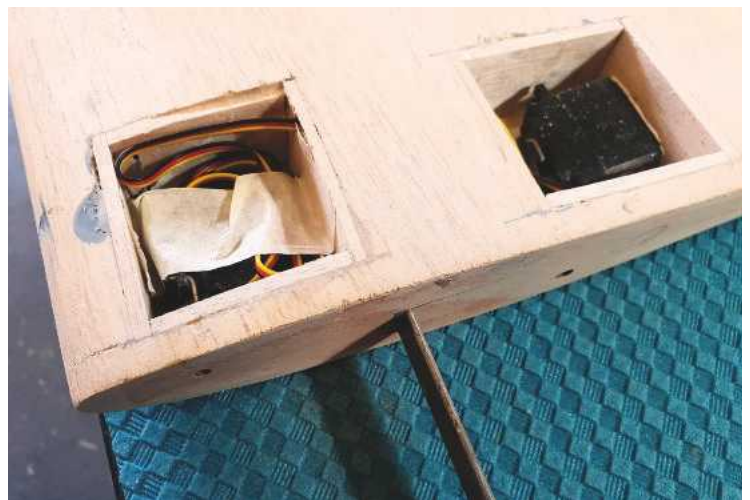
*Simple method of correcting a warped fin is to butcher the fuselage and then re-glass from the inside.*



*FS25 fin and tailplane sit correctly after internal glassing.*



*Wing box fitted perfectly. A mould was made to produce a glass fibre hatch as the original plastic version had perished with age.*



*Servos were fitted in the wing root rather than in the fuselage.*





**Multiplex spinner is strong enough for 42mm diameter motors up to 950 watts and conforms perfectly to the FS25.**



**I was thrilled with the Andy Schafer Graphics and that the ancient plastic canopy was still in perfect shape!**



**The FS25 kit is transformed into a beautiful swan, with wings spread and eager to fly.**

so that the tailplane looked delightfully jaunty! To rectify this ugly issue I cut a neat slit along the base of the fin, intercepting the boom at its midpoint and extended the opening, tapering it carefully into a shape that then absorbed the discrepancy when leant back and strapped with heavy duty nylon reinforced tape after a bead of Liquid Weld was applied to seal this joint. The inside area of the fin and the base of the boom were reinforced with carbon fibre cloth and Easy Composite skinning epoxy, as were areas of the fuselage around the wing seating and forward fuselage to support the aerodynamic loads without the need for extra formers.

I fitted a FES, of course, using an Airtek Hobbies 800 kV Airmax 4250, which on a 4S LiPo provides ample power (950 watts) to hand launch this pretty old bird. The 5mm motor shaft fitted a Multiplex spinner that was meant for the FunRay or Heron and the profile blended perfectly with the contours of the FS-25, so I was delighted to achieve this aesthetic scale look so easily and inexpensively. The 5000 mAh 4S LiPo fits on a platform behind the motor, secured with heavy duty Velcro, and enabled the correct Centre of Gravity position to be achieved without any additional lead ballast. Mini slim profile servos were fitted in the wing root to serve the aileron and airbrake pushrods rather than the outdated method of centrally mounting a standard sized servo in the fuselage to operate both wings. I bought the Airtek Hobbies JX brand to try out instead of Hitec 125s, which are just £13 for their HV2107MG. With 7.9 kg.cm torque on 7.4v they are a useful little wing servo. I have started using their K Power DMM090 standard sized servo instead of the Hitec 645 as they offer 10.5 kg.cm torque in a metal geared, digital and high voltage robust package. They have excellent resolution and operate very smoothly under load for just £15.

Andy Schafer Graphics provided the finishing touches to our joint design ideas, which brought the bland white finish to life. I shall be finally flying the FS25 in the next few weeks so will report back with flying photos.

## KRAKEN

'Mr. Lead Sled' is a long-term friend from Leicester, who I have mentioned in the column many times over the years. Ian Hammerton loves the Orme on a big air day as the hardware that he creates relishes the huge lifting capacity of the famous 'Rock'. In fact, his models only ever fly to their full potential when Ian presents them to the 40mph south westerly winds at this hallowed place in Llandudno.

His passion for the sport is infectious for sure, so much so that he will travel 300miles in a day to make the pilgrimage to Wales and back to fly his stunning self-made creation - that is dedication and commitment! I am impressed with his tenacity and resolve to see a project through to completion without

deviation or distraction. Ian has images and shapes that manifest in his mind's eye and they may have a gestation period of up to three years before they are born onto the drawing board. Once the shape has been hatched in full-size, two-dimensional form, Ian's envious skills as a modeller becomes evident as the three-dimensional shape appears out of a block of particularly hard balsa wood or Jelutong carving wood. Previous designs include the Valhalla, a Reno Mustang and an F-20 Tigershark look alike, all of which are still flying in their glistening,



**Ian Hammerton is a man with a vision and the resolve to realise his dreams. Kraken is born to the world and... wow!**





Such craftsmanship and dedication as the plug is removed from the new mould.

glassed and painted original finish.

Here are Ian's own words to explain the journey so far of his lock down project, the Kraken:

"Flying tough, compact and very heavy models on large slopes in big winds is great fun but these types of models can be hard to come by, and difficult and time consuming to build. They usually are in one piece making them awkward to store and transport and by their very nature they can be short lived. The concept of Kraken, therefore, was to design such a model but to do all the hard work up front, making fibreglass moulds so as to be able to duplicate the plane in the future and to be able to play around with different weights/layers of carbon for the wings and fuselage. Also, to make the wing removable for storage and to be able to replace parts rather than the whole model should disaster unfold.

Designing your own plane is very rewarding and what's more you can make it exactly how you intended without compromise. I yearned for something a little sleeker than other sleds, with a higher aspect ratio and maybe a little lighter, aiming more for 30-40mph winds rather than the 50+ of previous designs. The RC14 wing section has been around for many years and is ideal for blasting around on the slope; it carries weight well and allows itself to be slimmed down (in this case down to 6.5% thinness!) and so is an ideal choice.

There are many different techniques for building, both traditionally by hand and these days, of course, digitally using modern CAD equipment. But I prefer hand crafting on the whole, with a little digital input on this occasion.

After much drawing, designing and cutting out card wing templates to see how the finished plane



Kraken wing mould being created around the wing plug.

could look, the plugs were then made. The wing plug was made using blue foam cores skinned in carbon with wooden leading edges and tips, and then painted. The plugs only need to be strong enough to withstand making the mould, so accuracy is more important than strength at this stage. I am very grateful to William Deighton, who is a master of all things digital, as much for his own benefit as much as mine, as he was interested in the results for his own future projects, ultimately printing plugs for a 3M DS plane. He kindly 3D printed different types of tailplane plugs, the most successful being a 'Positive' plug of the tail, including the parting board, which allowed me to then make a fibreglass 'Negative' mould from this. This saved heap of time and provided a tail with an accurate and fast aerodynamic section.

When the wing and tail moulds had been made these plugs could later be used to complete the fuselage plug, making sure the incidences are correct in all aspects before finishing. For the prototype, out of the mould, I wanted to be safe and so decided to not be concerned with the airframe weight - it will just need a windier day, that's all! The lighter versions of Kraken can be created after flight testing and evaluation.

The wing was laid up in the moulds using 50-gram glass, 200-gram carbon cross weave at 90

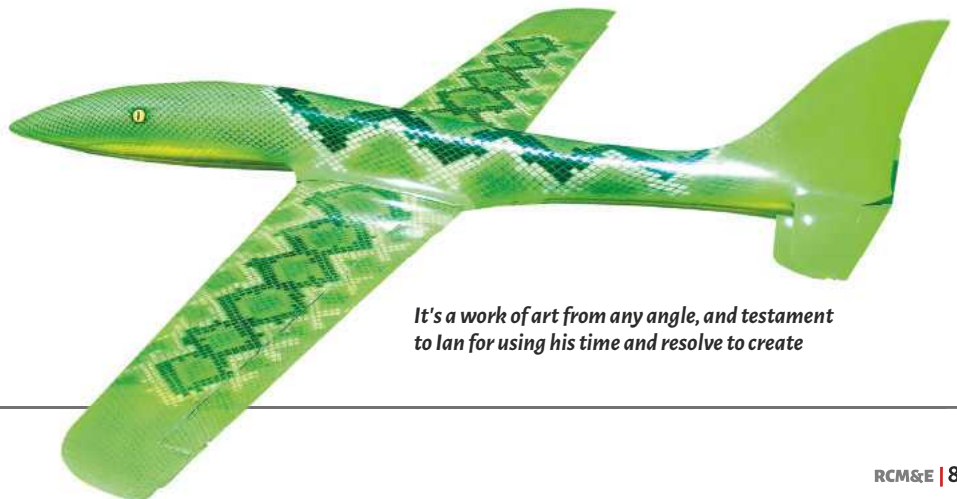


Fresh out of Ian's self-made moulds. Note the Kevlar nose area so that 2.4 signals can be easily received.

degrees, 300-gram kevlar as a living hinge for the control surfaces, 1.5mm core matt and finally 200-gram bilateral carbon at 45 degrees. Carbon sock was used over soft plastic tubes to create a main spar and sub spar, with epoxy resin and microfibres mix spread all around the edges before closing the mould. This layup has resulted in a very strong wing with no twist flex, but a beefier spar is going to be needed in future lay ups as the wing does have a little flex lengthways. The tail is made similarly with lighter carbon and has turned out to be perfect.

The fuselage was a mixture of several layers of 300-gram glass and 200-gram carbon with kevlar in the nose area to make it 2.4Gig radio friendly. This lay up too has proved to be perfectly sufficient strength wise.

Right from day one I had the final image in my imagination of the aircraft being painted to look like a snake; it's probably not very wise to put so much effort into painting a prototype but lockdown has provided many of us with excess spare time and if you have a persistent itch then you need to scratch it to make it go away! The appearance of scales is achieved by first priming, then spraying all over a dark green, allowing that coat to dry completely. I then stretched fishnet stockings over the fuselage and taped them into place to prevent them moving. Spray primer was followed by the light green, spraying the pattern using a fine airbrush to create each scale individually. I removed the fishnets when the paint was dry and many coats of clear lacquer



It's a work of art from any angle, and testament to Ian for using his time and resolve to create



*Kraken is a handsome snake with a 3D trick up its skin. Soon to be heading past my noddle at 150mph on the Orme!*



were liberally applied, flattening back between each coat.

The results are very effective, and I was delighted with my work. After the installation of the radio gear and balancing of the Kraken the finished all up weight came to 4lb, providing a wing loading of 36oz per square foot. This is a perfect end result, with sufficient mass for potent penetration into the autumn gales that I will await to use for the maiden flights on the Great Orme."

Ian has crafted his most stunning lead sled so far and it is testament to his creative genius. I am certain I will be present on the Orme soon to launch the Kraken, for a 'Crackin' day of celebration of high-octane slope soaring.

## PSS VULCAN

The Vulcan cold war bomber is an iconic British design, which has a place in our hearts alongside the Spitfire, the sleek Concorde and the EE Lightning. For me the childhood images of this enormous bat wing machine still resonate as clear memories...

Woodford Airshow in Cheshire was never missed and provided the opportunity every year to soak up the thrill of full-size aviation. I was awestruck every time I watched the mighty Vulcan conduct a short, oblique landing approach, flaring and completing an

arc onto the runway at the same moment. A few seconds of relative quiet were shattered as the pilot pushed wide open the throttles of the four Olympus jets, causing the Vulcan to leap off the asphalt once more into an impossibly steep climb, followed by a wing over. The bomber seemed to hang in the air at the zenith of this ear shattering manoeuvre and I recall even at this early age wondering if the aircraft would stall and fall out of the sky.

PSS has been the perfect medium to express my longings to fly scale models, combined with an unquenchable passion for all aspects of slope soaring. South Hertfordshire Models produced a model design of the Vulcan, replicating the full size accurately, including the unusual wing sections using the wind tunnel model drawings by AV Roe. Matt Jones from the Oxford area was the first to build a dedicated PSS airframe from this excellent plan and he proved without doubt the flying pedigree of its adaptation to the slope. The wing design on this occasion offered a benign platform with outstanding performance and impeccable handling - simply sublime!

The late Terry Lidstone was inspired by Matt's success and built a basic airframe before passing. I purchased the balsa marvel, but before I could focus my attention on the project it was snatched from me by a far more

Vulcan obsessed modeller, my auld mate Andy Gough. He was practically Spok incarnate once he had laid his eyes on the balsa airframe in my workshop, so I reluctantly passed on the project. Andy has finally completed the impressive machine over lockdown, which is finished in the nuclear blast reflective paint scheme. He has lavished his love liberally through the process of finishing the model so that I am certain even Terry, a most fine builder, would have been proud too.

This striking model has a wing span of 72 inches and wing area of 9 sq.ft., so the wing loading of just 18 oz./sq.ft. will enable this PSS model to even fly well from our local hills in the Peak District, precluding the exclusive need for the Orme for this versatile aircraft. Once again, I shall be there to launch the precious entity and to take photos, as I have so many times when flying with Matt Jones.

I would like to offer a tribute to Steve Griffiths and Walter Audley, who were the first PSS Vulcan pioneers back in the early days of this movement. Check out their visionary Vulcans on [www.pssaonline.co.uk](http://www.pssaonline.co.uk) in the model photos archive and you will be amazed.

Feel free to get in touch at [flyersanonymous1@aol.com](mailto:flyersanonymous1@aol.com)  
Happy landings. ✈



*Andy Gough's dream model is now finished and raring to go for its maiden flight.*



*Wing area galore and not that much drag, so this Vulcan is destined for our local slope.*





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# NEXT ISSUE

**RCME**

November 2020  
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## QUICKIE GHOST

Quickie Ghost is a simple to construct three channel trainer with a twist. This traditionally built model, designed by Tobe Kallner, has an unusual control option - Galloping Ghost. Although you can use traditional servos to steer it around the sky, to add a bit of interest to your piloting pallet Tobe has also designed a modern 3D printed Galloping Ghost actuator compatible with all 35 MHz and 2.4 GHz radios. When coupled with the necessary Arduino based re-coder electronics, designed by Phil Green, it will give you a new control experience that was last popular in the 1960s.



## FURY RIGGING

In his next 'Make It Scale' column, Danny Fenton makes good progress with his Dennis Bryant designed Hawker Fury 1 biplane. This time he describes the rigging process for both the wings and tailplane, before moving on to tackle the scale exhaust stubs.



## WESTLAND WHIRLWIND

John Hurdle describes his lovely model of the Westland Whirlwind. This distinctive aeroplane was the first single seat, twin engine, cannon equipped fighter to enter service with the RAF. Based on the Radio Modeller plan (RM111), John's elegant 65" wingspan model sports twin electric motors in lieu of the .30 glow engines for which it was originally designed by Messrs. Cronin and Hollandby.



## PIK 5C

Keen aerotow enthusiasts, Frank Skilbeck and Roger Spragg describe their build project from last winter, which is still waiting to fly due to the cancellation of many aerotow meetings because of Covid 19. Searching for a subject that they believed had not been modelled before, they settled on the Finnish Pik 5C training glider and it certainly looks eye-catching, with varnished ply on its wing leading edges and fuselage panels.

**RCME**

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# PARTING SHOT



## PETRELS PAIR UP

This picture by Barry Cole captures a brace of Slingsby Type 13 Petrels belonging to Chris Williams and Geoff Crew in tight formation. These are the 1/5 scale versions, as featured in the RCM&E free plan from July 2019, caught in action over the White Sheet Club's South West bowl. Keep an eye out for Chris' next 1/5th scale vintage soarer, the gull winged Minimoa, coming early in 2021.

*Photo:* Barry Cole

*Camera:* Canon EOS 70D

*Aperture:* f/5.6

*Focal length:* 70mm

*Shutter speed:* 1/1000

*Lens:* EF70-300mm f/4-5.6L IS USM

*ISO:* 100



# PILOT-RC EDGE 540

## FEATURES:

**NEW!** Hybrid construction from wood and composite materials for specially reinforced fuselage and wings.

**NEW!** Patented quick assembly system for wings and SFG.

**NEW!** Patented quick assembly system for canopy. Especially useful for electric version, allowing fast battery change!

Available in two colour schemes.

**WINGSPAN:**

74in (1.88m)

**LENGTH:**

65.95in (1.67m)

**MOTOR:**

30-40cc or or  
Electric equivalent



**NEW**

**NEW**

**WINGSPAN:**

67in (1.7m)

**LENGTH:**

63.8in (1.62m)

**MOTOR:**

20cc or Electric equivalent

# PILOT-RC LASER-67

That's right! Another new size of the popular Laser, this time for 20cc engines or electric power!

With hybrid construction from wood and composite materials as well as patented quick assembly systems for the wings, SFG and canopy this Laser is every bit as fast and agile as its bigger siblings.

Available in three colour schemes.



Black Frame  
with Red Lens



Grey Frame  
with Blue Lens



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# A NEW HIGH QUALITY RC MODEL FROM **DYNAM**

## BOING-STEARMAN PT-17

*Dynam bring to life one of the all-time classic biplanes with the release of their new 1300mm wingspan Boeing Stearman PT-17.*

A primary trainer for Allied WWII Pilots, it's classic design with radial engine and instantly recognisable colour schemes will no doubt make this Dynam rendition a firm favourite at the flying field.

The 1300mm wingspan provides a great blend of stability in most conditions, while being easy to transport to your favourite flying spot. Choose from either the eye catching yellow 'Navy' or the blue/yellow 'Army' schemes and just add your choice of battery and radio system to be ready to take a timeless piece of history back to the skies.

**NEW!**



### SPECIFICATION:

- WING SPAN: 1300MM
- FUSELAGE LENGTH: 995MM
- ESC: TC SKYLORD 50A ESC
- PROPELLER: 2-BLADE PROP 13X6
- MOTOR: DETRUM BM3527 KV650
- SERVO: 9G X 2, 17G X 2

### REQUIRED TO COMPLETE:

- TX/RX REQUIREMENT: 6-CHANNEL
- LI-PO BATTERY: 14.8V 2600MAH 25C



E&OE

DYNAM BOING-STEARMAN PT-17 RRP: £209.99  
PART NUMBER: DYN8977LPNP (YELLOW) DYN8977BLPNP (BLUE/YELLOW)

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