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JUNE 2016

# BELL XP-59

## PROTOTYPE WW2 FIGHTER



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# Pre-flight

**W**elcome to the June issue of RC Model World. Gray's regular column, The Sport Channel, has become our traditional way of ending most issues of RC Model World. A regular source of material for his column, and one that has been raised recently, are Keil Kraft models. And much like Terry had his TOG's, Gray has his band of Keil Kraft Kids, a grouping in which I am very happy to be included.

I cut my aeromodelling teeth on a wide range of small Keil Kraft gliders and rubber powered models, after my father brought home a rather dog-eared copy of the KK Handbook one fateful day in the 1960s. I was hooked, and have been ever since.

Naturally, I had my beady eyes on the beautiful Elmira glider in the radio control section for my next Christmas present. But as a young lad I had no appreciation of the cost of the kit, nor the 27 MHz R/C set that would be required to fly it. My parents were rather better acquainted with the relatively higher costs of R/C model flying back then and, very sensibly, they heeded the advice of the shop assistant in The Model Shop, Maidstone (sadly, like so many, now long gone) and purchased for me the rather smaller and far less costly Soarer Baby.

After carefully unwrapping the paper (and returning it to my mother for use the following year!), my disappointment was short-lived and I spent a happy day studying the plan and poring over the small number of die-cut sheets that contained exciting new things like fuselage formers and wing ribs.

A short while later (and with a lot of help from Dad) it was time to launch the small glider from a hilly valley in the local park. A little of bit of packing under the tail soon had the trim sorted and she sailed away on the first of her many short flights.

Many more KK models followed, and I even managed to finish off Dad's big Chief for him. That got chucked off the hill too, although it needed a much longer run from me as the 'fetchermite'! (I never did get the auto rudder to work, and probably a good thing too as I would have had some explaining to do if she had ever hooked a thermal!)

Thanks to Gray, I have now been reunited with plans for the Soarer Baby and the Chief. And, what's more, I also now have plans for the Elmira too – a dream come true!

You can read a bit more about KK Kids in this month's Sport Channel, as well as tucking into some of our other regular columns too, including Light Flight from John Stennard, Scale Soaring by Chris Williams and Soarers' Slot by Mike Proctor.

Kits on review this month include the Hacker Vagabond XL aerobatic electric glider and the conclusion of the Seagull T-28 Trojan review, which was held over from the April issue due to rather soggy local flying fields. Richard Crapp also previews his latest scale masterpiece, a Junkers D.1 built from the Balsa USA kit. And we wrap up our test reports with a look at two of the latest multirotors, the 3D capable Ninja from JR Propo and the nippy Traxxas Aton, which features a novel 'airbrake' function.

Our feature plan this month is for a twin boom sport scale model of the Bell XP-59, an experimental design that never actually flew. And in the middle of the magazine you will find a pull-out plan for Zortayak 55, a largely foam based 3D aerobat on which you can practice your low, slow flying stunts.

In an article on Classic Aerobatics, Terry Westrop welcomes our readers to the growing retro R/C aerobatic scene and we also have a pair of informative articles on how to make and fit engine cowlings.

A fair amount then to keep you entertained and informed. So until next time...

Happy flying!

Kevin



## Kevin Crozier

Editor | Radio Control Model World

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# TRAPLET

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# Kevin

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# Take Off R/C News and Views

If you have any news or special interest announcements to make, or even a recently completed RCMW plan design, then why not drop RCMW a line or email [RCMW@traplet.com](mailto:RCMW@traplet.com)

## Ugly Anniversary

One of aeromodelling's most endearing designs took to the sky for the first time in 1966 – Phil Kraft's 'Das Ugly Stik' (or is that Stick?). To celebrate the 50th anniversary of this much loved aeroplane, Andrew Weight and his brother Mark assembled two new versions. Here's what Andrew has to say about the colourful pair:

*"It's taken myself and my brother Mark sometime to get these Ugly Sticks done. Amongst other projects, we wanted to honour the 50th anniversary of Phil Kraft's design in some way. Now that we are totally electric, and have been for at least the last fifteen or so years, we thought that the Ugly Stick was a good aircraft to electrify, after having electrified Das Liddle Stick. One of our electrified Das Liddle Sticks can be seen on YouTube (Google 'wingweight youtube')."*

*The models were built from the original Phil Kraft plan of 66" wingspan. Monokote covering, with trim from Monokote also, in an American theme in tribute to the USA and NASA, for the Ugly Stick came out of the Apollo rockets era and before man walked upon the moon! Futaba radio was used all round, with only three Futaba 148 servos in each model and the original bellcrank set-up used for ailerons.*

*Our Dad's original Kraft 1968 sets are used in the pictures for display purpose only, although they are still in perfect working order – we will use them again when 27 MHz comes back into fashion! Axi 4120 motors were used, with a Jeti 70 amp ESC and 5S 4500mAh LiPo. Flying weight is approximately six pounds.*

*We altered the models from rubber banded-on wings to bolt on, and inset the ailerons as the original models suffered from aileron flutter when the ailerons went right to the wingtips. Also, we did not go with the scolloped trailing edges, as we wanted to leave a bit more area for the control surfaces.*

*RC Model World is the best magazine out there now. And we should know – we've been modelling a long, long time...!"*

A great pair of models, Andrew, and a fine tribute to a fabulous design. Thank you for sharing them with us.



## Skyhawk Mass Build Launched



Phil Cooke of the Power Scale Soaring Association writes in with more details about the group's latest mass build, based on the RCMW A4 Skyhawk plan, woodpack and canopy (SET3775) available from Trapletshop.com:

*"Just a note to you and the team to say a big thanks once again for all the help and drive you applied to the PSS A-4 Plan, woodpack, canopy and magazine presentation. You'll be glad to know the 2016 PSSA Mass Build venture has been launched today, 1st March, and we should from now see a surge of builds commencing, not just in the UK but abroad too. I've got registered builders as far afield as Australia, Japan, the USA and Belgium.*

*I've started my 'production' build last night and created my build blog on the forum. There will be many more*

*very soon I'm sure: [www.modelflying.co.uk/forums/postings.asp?th=115393&p=1](http://www.modelflying.co.uk/forums/postings.asp?th=115393&p=1)*

*Feedback from those that already have the parts is very good. Everyone seems delighted with the plan, the quality of the wood and the canopy.*

*My build won't be too pacey. We have a few months until the PSSA Fly-In on the Great Orme, 10th and 11th September. I do hope you will be able to support this with your A-4; it would be great to see some of the Traplet team members there. It should be quite a spectacle too – I would easily expect 25 of the models in build to be there on that weekend."*

## Calderdale MFC Seek Members

Calderdale Model Flying Club, situated in the Crossland Moor area of Huddersfield, are looking to recruit some new members. The club's flying site is a large field that is available all year round for members to fly all types of R/C aircraft and helicopters.

If you are a beginner then the club want to hear from you too. They have a number of willing members who can assist new members to learn to fly.

Any interested persons are asked to please contact Malcolm Chambers:

Tel: 07484 735171

Email: [m.chambers730@btinternet.com](mailto:m.chambers730@btinternet.com)

## Pontefract Multirotor Fly-In

PANDAS model flying club are hosting a multirotor fly in at Pontefract Park, West Yorkshire on June 4th, 2016. Flying starts at 10 am. This is being run in conjunction with the club's annual fun fly event. Besides sport multirotor flying from the heli patch there will be a professional multirotor pilot to demonstrate and discuss this aspect of flying UAV's. A small FPV course with air gates will also be available.

This is purely a fun event to encourage multirotor (drone) flyers to come along and socialise with other interested pilots, whilst promoting the BMFA's Drone Aware campaign. If you have any interest in multirotors or are just curious about drones, come down and meet up with like-minded individuals. Also, why not bring any unused multirotor related items to sell. Entry to the event is free, and also to fly. If you don't have a BMFA 'A', SAA or LMA achievement equivalent don't worry as PANDAS can supply a qualified pilot to stand with you. But you do need third party insurance.

Alternatively, the club are planning to offer a drone flight experience via a buddy box, if things go to plan.

The flying site is situated within Pontefract racecourse. Leave the M62 motorway at junction 32, head towards Pontefract on Park Road and follow the direction markers to the event. Please email [areapleyard@msn.com](mailto:areapleyard@msn.com) with any questions and to confirm your intention to attend.



## Southern Model Show

Headcorn Aerodrome, set in the heart of Kent countryside, will again host the Southern Model Show over the weekend of 10-11th September 2016. The airfield is always busy with parachuting, pleasure flights, balloon flights, helicopter flights and visitors to the Lashenden Air Warfare Museum (*and R/C flying by members of my old model club, Maidstone MFC! – KC*).

The Southern Model Show will feature an eye-catching array of model aircraft, helicopters, ships, tanks and other vehicles. A full range of other activities and a showground packed with traders makes this a 'must see' event for anyone with an interest in model hobbies, whether experienced or a beginner.

Have you got a model you want to sell? Or fancy picking up a second-hand bargain? Then visit the popular Bring and Buy stand – who knows what you might find?

The flying programme promises to be exciting and varied, with a series of set piece historical displays. D-Day will feature prominently, as will the Battle of Britain, which is apt as the show is being staged in Kent over the Battle of Britain weekend! From 7.50 pm to 8.30 pm there will also be displays of night model flying.

The Lashenden Air Warfare Museum is free to enter and will be open on both days. The Museum is one of the longest established aviation museums in the country, having been formed in 1970. For more museum and show information please visit: [www.headcomevents.co.uk](http://www.headcomevents.co.uk)

## 3D Modelling Appreciation



Darren-Edward O'Neill from Johannesburg, South Africa writes in praise of Mal Luff's recent articles on 3D modelling:

*"With regards to Mal Luff's great articles on 3D modelling. A great read, well written and timely given the emergence of this amazing technology.*

*As a designer (illustration, 2D, 3D and animation) with nearly 23 years of experience, I found the article of particular interest, given a life long passion for R/C aeronautics and my new found interest in 3D printing. Obviously the more basic fundamentals of 3D design are well trodden by me and I wouldn't have expected to learn anything new in such an article.*

*Yet I was surprisingly captivated by the read. Mal did well to present the skill as attainable and completely doable to even the most apprehensive and inexperienced reader, and did a great job of promoting the technology.*

*If there's one criticism it would be that the first major hurdle that has dissuaded many a newcomer would be the fundamentals of the workspace of a typical 3D program. It's true enough that programs vary in complexity and that one has a lot of choice nowadays in the type of 3D software (and apps) available. But I have found that most follow a universal format and as such can be generalised and taught in a similar manner to how he broke down the basics in this article.*

*It is easy to say that with a basic understanding of the methods explained one can navigate through*

*the tools and functions of the chosen program. But I really found understanding the program well enough to execute simple tasks from concept to production or output to be my first daunting mountain to climb.*

*That said, having persevered with the really inadequate learning material of the time and now having encountered the author's clear teaching method, I've realised that it really is entirely possible to cover the fundamentals in an article (possibly a series) like this.*

*Thank you for another inspiring edition and for keeping my passion alive. I know very well the effort that goes into producing a publication like this, so to me RCMW is true gold!"*

Thank you for your kind comments, Darren-Edward. UK readers can see one of Traplet's 3D printers in action by visiting our stand at the major model shows over the summer (and possibly even talk to Mal!). You can also see (and buy!) examples of Mal's 3D prints in the form of a range of WW1 guns, which are sure to add a realistic finishing touch to any suitably scaled WW1 model.

## MSRM Drone Weekend

Mike Rieder, Chairman of the Mid Suffolk Radio Modellers has sent in a short report on the club's Drone Weekend, held over the 16th and 17th April. Pictures courtesy of Alan Gamble:

*"Last year we sat down as a committee to look at what events we would hold for the coming season. Due to an article in the BMFA magazine on their Drone Awareness month we thought it would be good for us to support it by making one of our events a Drone Weekend. We have a number of competent and keen quad and drone flyers within our 60 plus membership, so it would be a great way to give them an opportunity to show the fixed wing flyers within the club what they are capable of and to potentially bring in new members, as well as imparting some advice to local, non-BMFA/MSRM flyers.*

*The overall object was to support the BMFA with their Drone Aware month. But we were also keen to see if the event would draw in any new members as we have two sites and the majority of the members that have joined in the last couple of years only fly at our relatively new grass site. So setting the Drone Weekend at the old American airbase near Eye made sense due to its hard standing areas and space for an FPV track. It is easy for visitors to find and we wanted to encourage more members to use the facility.*

*On contacting Manny Williamson at the BMFA we got funding and support to get signage, flyers printed and the use of their FPV track equipment. We set about advertising in local shops, schools, hobby shops, Maplin's etc., with a number of roadside signs put out as well. Plus use of social media, with it all linked to our new website [msrm.bmfa.org](http://msrm.bmfa.org), which seemed to work judging by the response we got online and over the weekend. This was well worth doing, even though it took quite an effort. But it allowed us to get to a much wider audience than normal, which was the whole point of the event, as we wanted to speak to flyers that hadn't considered getting insurance or becoming part of a club.*

*We set up on Saturday and after looking at the forecast the weather was supposed to be okay and getting better. Well it didn't! It drizzled then poured but we kept a stiff upper lip and carried on. A number of*

*interesting flights were made and considering the conditions we still had a good number of visitors and members, with a few potential new members signed up.*

*Day two dawned bright, clear and with light winds (the sacrificial burning of hot dogs must have worked). We managed to set up the full quad track and had constant flying of all types of quads from 250 racers to fully camera equipped heavy lifters. This was supplemented by a full program of fixed wing flying throughout the day. There were a fair number of tumbles into the muddy field around the racing track but only the odd prop was damaged.*

*There was a constant stream of visitors interested in what was going on with advice, leaflets, stickers and hot dogs given out. We were supported by Hobby King, who gave us a FPV plane and a couple of frames to auction, which has covered our costs, as well as hopefully gaining us more than a dozen new members.*

*So overall the members had one good day (and one wet one!), with a lot of banter, potential new members and the satisfaction of spreading the word of our great sport a bit further and in a better light."*





# THE GREAT WAR NEVER FLEW SO GOOD



## 1/4 SCALE JUNKERS D-1 Kit No. 422\*

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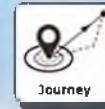
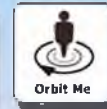
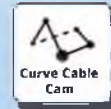


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# Caproni Ca. 100

For his latest feature on Italian R/C floatplanes, Franco Bugada looks at Renzo Fiori's familiar looking biplane, which Caproni built under licence from de Havilland. With additional historical images from Giorgio Apostolo



Atmospheric shot of Renzo Fiori's Ca. 100 model in flight with scenic Italian lakeside mountains in the background

The Caproni Ca. 100 was a very famous trainer in Italy during the 1930s. This aircraft was designed by modifying the original drawing of the de Havilland DH.60 Moth. On the basis of Caproni's experience with his bomber, the Ca. 73, the upper wingspan was decreased. It also received Handley Page style slats on the leading edge but during its production the slats were not always installed. Originally it was equipped with a de Havilland Gipsy engine of 85 HP but the aircraft received many types of engines, both in-line and radial.

The Ca. 100 was born in 1929 as a

two-seat light biplane destined for civil use by the Italian Aero Clubs, as well as a military basic trainer. The aircraft was still being used during the Second World War.

It was built in land and seaplane versions, as well as an amphibian. In 1931 a seaplane version obtained an altitude record of more than 17,400 feet. In 1933 the aircraft was sold to Portugal, then in 1934 it was converted to a bombing trainer for the Italian Air Force. In 1935 a special agreement with the Peruvian government resulted in the construction in Peru of a factory capable of manufacturing the aircraft, which produced

twelve Ca. 100 aircraft but with very high costs. The machine was exported from Italy and also to Bulgaria.

The aeroplane's nickname was 'Caproncino' (or 'Little Caproni').

During the Second War the Australian Royal Air Force and the R.A.F. used five captured Ca 100.

## The Model Of Renzo Fiori

Our friend Renzo had the opportunity of looking over the details of the aircraft still existing at the Aero Club of Como, which has been carefully restored and maintained in flying condition. Sometimes it is also possible to view the plane, COM-11, flying on Lake Como, which is the only water runway still officially existing and authorised in Italy. So Renzo, living close to the Aero Club of Como, was able to check his work during the construction of the model.

The fuselage structure was obtained with the traditional system of one main bulkhead and five poplar plywood frames connected with lime stringers. The engine is mounted on an aluminium support. The fuselage sides, from the engine cowling to the lower wing, are covered with 1 mm plywood and 2 mm balsa, and all of the fuselage is covered with fibre tissue.

The lower wing has four spars, 5 x 5 mm strips and balsa ribs of 2 mm thickness. The ailerons are controlled by one servo installed in the middle. The up and down motion is obtained with a rigid steel cable and bellcrank. The upper wing is manufactured in two parts and has two 5 mm square lime spars. The wings are assembled using an 8 mm diameter carbon tube and a secondary 4 mm dia. steel joiner. The wings and



Renzo prepares the model for flight



ailerons are covered with heatshrink tissue, then accurately painted.

The floats are from polystyrene, covered by 2 mm balsa and fibre tissue. All bracing is made with steel cables, just like the full size aircraft.

The flight of the Caproni Ca.100 is very nice. Take-offs and landings are smooth, but the short floats require some attention and practice in order to avoid capsizing. It's a very nice and interesting model that's very well manufactured. Renzo has participated in many waterplane meetings and has had great success with this model. **RCMW**

**MODEL WORLD**

**Model Specifications**

<b>SPAN:</b>	2 m
<b>LENGTH:</b>	1.50 m
<b>WEIGHT:</b>	4.8 kg
<b>MOTOR:</b>	OS 120 Surpass 2
<b>PROPELLER:</b>	14" x 8"
<b>RADIO:</b>	Futaba 9 CAP
<b>SERVOS:</b>	(4) Futaba 148



The beautiful scale model sits on the pebbles of a lakeside beach



This Caproni Ca. 100 seaplane was equipped with a radial engine



A line of Ca. 100s in the 1930s



Original instrument panel of a Ca. 100

Continued overleaf





R/C model of the landplane version during an exhibition at the Volandia Museum



Renzo and his assistant are seen starting the OS 120 engine



Ga. 100, COM-11, taxis out in preparation for take-off into the wind



The take-off begins!



Splash down after another successful flight



Approaching the beach, this picture clearly shows the clipped upper wingspan compared with a DH 60 Moth



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# Vagabond XL Electro

Mark Wilcockson takes a peep into the latest slim red box sent to us by Hacker Model Production



**W**ith a trip planned to the RC Hotel in Corfu in early summer, my thoughts turned towards what planes I wished to take. Rather than use the planes that Spiros has on site, I prefer to fly my own aircraft. My sweet spot was an electric glider of modest cost, preferably aerobatic and quick to build. I had been looking at the Hacker range, along with other foam electric gliders, and the opportunity to review the Vagabond XL Electro could not have been better timed as it ticked all my boxes.

The box duly arrived and first impressions were that this would indeed be a simple and quick build, with just 34 parts listed in the manual. It's a great first impression, with the main components, with the exception of the fuselage, covered in clear laminating film, giving a great finish for a foam glider. I guess the complex curves of the fuselage make covering this impractical.

Along with the glider parts, also included were a fifteen page black and white photo manual and the motor tuning set (available separately). This comprises of an MForce 2826CA -15 motor and a 22 amp MForce speed controller. This then leaves the builder to source the recommended 8 x 6 or 9 x 6 folding propeller and a suitable spinner, along with the servos and a suitable receiver.

On the whole the manual is easy to follow but some of the photos are a little grainy. This is not a problem for most of the build but it becomes important when assembling the all moving tailplane where it is easy to miss the fitting of the clear washers in photo 28 – you are warned!

## A Build Or An Assembly?

With so few parts it's hard to call this a build. It's more of an assembly, which can easily be completed over the course of a couple of evenings. The work starts with reinforcing the fuselage with five carbon rods, two down each side of the fuselage and one on the top. These need to be buried so they can hardly be seen before securing with thin cyano.

A tip from my F3P builds is to decant the cyano in to small 10 mm plastic bottles, using a thin metal tube as a tip (see photo). This allows precise control of where the glue is applied and makes it easier to get it right down into the cuts.

It is key at this point that you check that the fuselage is straight and that you have not introduced a curve when adding the carbon, before final gluing takes place. I checked by laying the fuz on a flat board and measuring the distance to the nose, before turning over and checking that the distance was the same – quite easy to do in practice. This is the point that the motor mount is added, once



Opening the slim red box reveals a low part count and excellent quality items



The review model was supplied with the optional Motor Tuning Set





Securing the carbon reinforcing rods using a dropper bottle to get the glue in deep



This plane is virtually unbreakable when the considerable reinforcements have been added



The rudder pushrod is buried deep



The ply central rib is easy to add



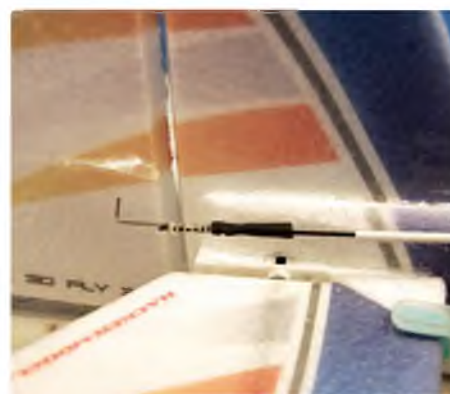
Don't omit the clear washers on the tailplane during assembly



Lining up the aileron horns for a slop free assembly



With the wings in place its time to check the alignment of the tailplane



The rudder pushrod, with the addition of some Kevlar thread

again secured with cyano before a tunnel is drilled into the fuselage for the motor wires to pass through.

The fuselage strengthening is finished off with the addition of the tube for the rudder pushrod, which is buried in the same way as the carbon reinforcement, and construction of the front pod deck, centre rib and reinforcements. I reckon all this reinforcement will make it virtually indestructible, as claimed proudly by Hacker on the box lid.

All appeared quite simple, but a problem would come up at the end of the build when I tried to fit in my 1300 3S LiPos, which were too wide for the opening in the deck. With the deck already glued in place it would have been hard to adjust it for my LiPos, which were 23 mm wide. I purchased a new set of batteries at 20 mm wide, which slotted in just fine. A little bit of forward planning on my part would have prevented this, as I could have adjusted the deck before gluing it in place.

Next comes the addition of the rudder and all flying tailplane.

#### A Few Points On The Tailplane

The photos show a wheel assembly linked to the tailplane, to get up to 90 degrees rotation. This is not included in the kit or referred to in the instructions. In reality the long horns supplied are more than sufficient

to get the movement specified in the manual and I think this looks a lot cleaner.

Being black and white the photos are not totally clear in showing the tailplane assembly. It's straightforward but make sure you include the clear washers, part number 9-6, as these are key in ensuring that the tailplane moves free and without binding.

A little of the covering needs cutting back on each elevator to secure the carbon rod with cyano. Add a little Vaseline on the bushes in the centre section to ensure the cyano does not bleed through and stop it moving. The holes cut can be resealed with clear tape once the cyano has been added.

I dry fitted the tailplane assembly to the fuselage but did not glue it in place until later so I could check the alignment with the wings once these were completed.

#### Wings And Things

So at this stage I put the fuselage to one side and started on the wings. This was an ideal opportunity to consider the servos I was going to use. The manual calls for three mini servos 1.7 to 2 kg/cm of torque for the ailerons and rudder. The elevator has specified a 2.5 kg/cm servo with metal gears recommended. I have had good success with KST servos on my gliders and decided to use the relatively cheap KST DS113MG, which are around £10 each, on all surfaces, which

give 2.2 kg/cm on a 6 volt supply.

To provide 6 volts I planned to use a separate UBEC rather than the BEC off the speed controller, which was putting out 5 V. See photos to see how this is wired in.

The wings could not be simpler to complete, with the servos glued in place with UHU Por and connected with the supplied links to a horn cyanoed into the aileron. Apart from adding a wing end plate that's about it.

Mating the wings to the fuselage allowed me to make sure the tailplane was square and to cyano it and the rudder into place. The instruction manual shows clearly how to add the rudder and elevator servos and associated links. I have used the method of gluing the rudder carbon pushrod to the metal link before and it has proved robust. But just to make sure I wrapped the joint with some Kevlar thread I had in my spares box. Don't forget to rough up the end of the pushrod with sandpaper to give a better surface for the cyano to glue to.

So it's on to fitting the canopy. This requires a little trimming and a cut to be made on the nose of the glider to accept the canopy. It's secured with four drawing pin shaped pins that look like they have been 3D printed. The pins locate into two plastic tubes that are added to the fuselage before gluing in the plywood deck. Marks on the canopy show where to drill for the pins to go through before





Completed equipment bay. There's plenty of room in there



The LiPo is secured using an 'O' ring (not supplied). A great idea!



It's a good idea to reinforce the canopy with cross weave tape



Before flight always check the power with a Watt Meter



Canopy now added and nearly ready for its maiden

being glued in place. These were marked spot on and the canopy fitted perfectly.

### Final Installation

Last leg now, with the final installation of the motor and gear, and I needed to source a spinner and propeller. A quick check with my micrometer revealed the motor shaft size was 3.17 mm and I quickly received a 32 mm Aeronaut prop and spinner set from Stan Yeo at Phoenix Models. Stan has a handy prop comparison tool on his site and using this I chose a 9.5 x 5 folding propeller, which would give only just less thrust than the maximum 9 x 6 propeller specified.

With plenty of room under the canopy, the speed controller and BEC went side by side, with the receiver just ahead of the battery bay. The suggested method of securing the battery with 'O' rings is excellent and has proved itself in flight without any issues.

With new narrower batteries needed, after considerable review of the various options I could only find few that were a maximum of 20 mm in depth. Ultimately I chose Bolt 1300 3S HV batteries. These can be charged to 4.35 V per cell but so far I have only charged them to 4.27 V in an attempt to extend battery life.

Before committing to flight I used a Watt Meter to perform a static test and saw a maximum 14 amp current draw, well below the 22 amp speed controller's capabilities.

Finally, I set up the throws as per the manual. But instead of setting up two rates settings, I used the maximum recommended

throws and after looking at the deflections I added 90% expo on the ailerons and elevator, with the rudder given 50%.

And that was it. A couple of nights work and the Vagabond XL Electric was ready to fly.

### Flying

Eagerly anticipated, I had to wait a few days for the rain to stop. Why does that happen for a maiden? It's so annoying! However, the day finally arrived where we had a dry spell just before sunset. The plane was rigged in a few minutes on the patch and the obligatory range check was completed successfully.

A decision was made to perform a glide test before adding power and my brother Paul was dispatched up the hill to give it a quick chuck. No drama, a couple of clicks of up trim and the Vagabond was ready for a proper maiden.

A gentle lobe and the smooth application of power saw the Vagabond climbing at about 45 degrees. It took me a few seconds to realise that I was still at about 75% power and with the stick moved fully forward it quickly climbed to about 400 feet before the power was chopped. A couple of circuits in straight and level flight, with no further trim changes required, it was now time to see what this glider could do.

Over a couple of flights I flew every aerobatic manoeuvre I could. Most needed some power to keep the inertia, as would be expected. Inverted flight needed quite a bit of down holding in, which was not a

surprise with the C of G set at the initial forward starting point suggested by Hacker.

The battery fitting method makes moving this back progressively easy. Spins are a delight and with instant recovery. Snaps both positive and negative are effortless but completely stop all forward movement, so you need to get quickly back on the power. Four point rolls, rolling circles, blenders – you name it, this plane can do it!

I have added a snap flap mode to my Jeti transmitter, but in reality I fly mostly without it as it's not needed. Give it a go for the fun of it though!

Landings are simple as the Vagabond slows nicely without the hint of a stall and settles gently on the runway. So much so that I have not bothered lowering the ailerons to create a landing mode, as suggested in the manual.

After a couple of flights I passed the controls to my brother, Paul and nephew, James who both tried to test the claim on the box that this plane is virtually unbreakable. Whatever manoeuvre they flew the Vagabond lapped it up. We even flew some touch and goes just for fun, but don't forget to add some Diamond tape to protect the underside!

We all agreed this is a great, fun plane and a definite keeper. So much so that its departure to Corfu has been delayed for a year and I will fly it over the summer in the UK.





Vagabond XL excels in aerobatics!



And it's way for the maiden



A rare sight for this agile model as she holds straight and level flight



A low pass is called



Check out those huge ailerons!



A nice steady climb out

**Post Flight**

Post flying, I have the following thoughts. The canopy started to split after just three flights due to the way it is fitted to the fuselage. In hindsight I should have added a strip of diamond tape down each side as reinforcement, as it is relatively thin. This has now been done.

With my set up the extended horn on the elevator is not required. To get the recommended maximum throws I had to reduce the servo throws in my transmitter to 70%. This is not making best use of the servo and I will be swapping out the horn for a smaller one before I next fly.

Throws more than those recommended are not required. This was demonstrated when I tried a low level square loop. Pulling the first 90° corner saw the Vagabond pulling through 140° before I released – quite spectacular!

Overall I love this aeroplane. If you want a fun to fly, fully aerobatic glider this is the model for you. It will definitely put a big smile on your face.

**RCMW**



The author gets excited as he prepares to fly his new aerobatic glider



An excellent model for grooving around

**MODEL WORLD**

**MODEL INFORMATION**

<b>NAME:</b>	Vagabond XL Electro
<b>MANUFACTURER:</b>	Hacker Model Production
<b>WEBSITE:</b>	www.zoomport.eu/shop (search for Vagabond XL)
<b>PRICE:</b>	154.46 Euros
<b>MODEL TYPE:</b>	Aerobatic electric powered glider
<b>CONSTRUCTION:</b>	Foam, with wings and tail covered in clear foil
<b>PARTS SUPPLIED:</b>	Airframe and hardware,
<b>PARTS REQUIRED:</b>	4-channel R/C set, 4 micro servos 9-12 g (with metal gears), M FORCE 2826CA-15 motor, MC-22A ESC, LiPo 3S 1300-1600 mAh, folding propeller

**R/C FUNCTIONS**

1. Throttle
2. Ailerons
3. Elevator
4. Rudder

**MODEL SPECIFICATIONS**

<b>WINGSPAN:</b>	2010 mm
<b>LENGTH:</b>	990 mm



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# Classic Aerobatics

'Call me old fashioned!', says Terry Westrop as he takes us on a tour of the retro aerobatic scene  
All pictures courtesy of Martyn Kinder, UKCAA and Terry Westrop



Stu Foster's Moonglow at Barkston Heath



Starting a 1960s Astro Hog



Andy Green's Astro Hog in flight

**C**lassic aerobatics? 'Retro' may be a more acceptable definition and it's currently going on in most aspects of model flying. As a consequence traditional model building is gradually becoming part of model flying once again.

Many model flyers look at the FAI aerobatics of today and see modern 'styles' and hi-tech models that are usually expensive and generally lacking in similarity to what might represent a full size aircraft. They have evolved directly as a result of the schedules that they are required to perform. Their task is to fly constant speed manoeuvres precisely, with little regard to appearance. And this is perfectly fine for the discipline. In contrast to current day F3A models it is immediately evident that the designs of yesteryear (typically '60' size) will automatically help constrain costs and reduce build time. Consequently, when attending classic events with their latest creation or acquisition, pilots will not be overwhelmed by what they encounter on

the flying field. It once again provides an opportunity for any pilot to sample proper aerobatics for minimal cost.

## Memory Lane

My inspiration to fly aerobatics began way back in the distant mid 60s when still at school. I recall jumping on my cycle on any Sunday and riding 5 miles to RAF Henlow in Bedfordshire to watch model flying. It was predominantly reeds back then, proportional radio being in the first stages of development. Testing times indeed!

The model on the flying field that most inspired me was the 'Orion', kitted by Top-Flite. I still remember watching the pilot practicing a schedule. But it was not the schedule that demanded my attention, it was the model. The way it flew and, naturally, how well it was being flown.

It was not for a decade until I was tempted with an opportunity to purchase a 'propo' set. Some years passed, my ability improved and I began to sample aerobatics and various

model designs of the period (now the mid 70s). Although I never forgot that Orion. But, is it not such memories that influence and inspire many of us? There's something about those old model designs, despite the fact that they are (in their original form), more difficult to fly accurately than more modern types. The use of reed R/C required early F3A aerobatic models to be designed with inherent stability, using more dihedral and wing incidence, often with semi-symmetrical aerofoils.

## A Re-emerging Market

During the 1960s aerobatics was at its most prolific, not only in R/C development but model design also. It also enjoyed the highest profile in model flying. So today, for those looking to fly aerobatics but who prefer the older models, there are loads from which to choose. A number of companies are now reproducing plans and even parts for many of those old designs. There are also an increasing number of kits available, as





Another view of Stu Foster's elegant Moonglow



The author's 'Mustfire' EP, a modified 1965 design



Kwik Hi III from 1966



A pair of electric powered Moonglows. A 1967 design



Paul Bardoe's Taurus, which dates from 1964

classic aerobatics becomes more popular. Manufacturers, naturally, see an emerging market.

If the prospect of building from plans proves a little 'scary', despite the relative low cost and simplicity of those designs, second-hand models appear regularly.

It is still possible to acquire period IC motors (second - hand, of course) such as the R/C World Championship winning UK manufactured Merco 61 that dominated during the 1960s, if one is looking to produce a perfect replica. Naturally any IC motor, and even EP, can be used. A few use the older propo R/C and I have seen evidence that someone is actually using 'reeds'. Now that is quite something! I continue to use my 35 MHz R/C gear from 1989 effectively when operating my classic models.

During the 1970s aerobatic model design began to change and the 'fish' style of

fuselage, typified by Hanno Prettner's Curare, became the accepted norm. This style also led to increased model speed, hence the term, 'pattern missiles'. These are the models that I began my F3A competition apprenticeship with in 1980. They are great for typical UK windy competition weather, but not as appealing aesthetically to most pilots. If this style is preferred, once again there are lots from which to choose. By this time all the designs featured fully symmetrical aerofoil sections, longer moments and almost all sported a retractable undercarriage.

#### Modern Modifications

As I mentioned previously, modifications can be introduced to any design to improve flight characteristics. For example, the 'Mustfire' has a semi-symmetrical aerofoil. This is quite unnecessary and fully symmetrical sections are a great advantage.

Longer tail moments in the years since have proved far more beneficial for smooth flight and stability.

My preference is for those designs from the 1960s – memories of that Orion, I guess! I am invariably tempted to modify any original design, incorporating more recent features (discretely) that enhance aerodynamics. It's the spirit of the game that is important here.

My model suggestions? The general size is around 60" wingspan. As the flying weight can easily be as little as 5 lb, powering the model is a very simple affair as there are a vast diversity of motors readily available in today's market.

Since I began flying 'classic aerobatics' in 2013, I have built several, all from the 60s. My first choice in 2013 was Chris Olsen's 1967 design, the Nationals winning 'Upset II' using a 'soft mounted' Merco 61 from 1967. AUW is 5.5 lb. Slight modifications include a 2" longer

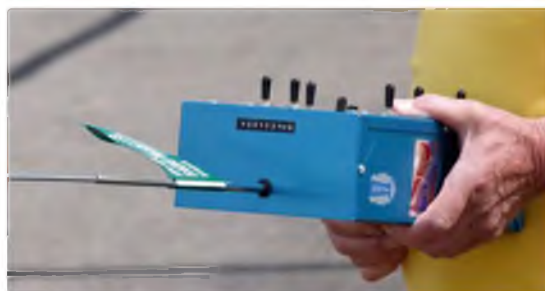




Turnout at a classic aero event in 2013



**Left:** Some modellers still use vintage R/C gear!



**Right:** A reed transmitter, using switches to operate the flight controls



**Left:** 1970s Bullets, all .40 size



**Right:** A Spectre being flown by Martin Fox



A true classic, Hanno Prettnner's Magic, with its distinctive anhedral tail. This version is owned by Samuel Wragg

tail, a larger rudder, larger ailerons, reduced wing incidence to 1/2 degree relative to the tail and conversion from trike to tail dragger.

In 2014 I decided upon Mike Birch's Nationals winning 1968 'Moonglow', which is of the smaller, thus easier to power designs, and has a good tail moment to promote smooth aeros. This model was built almost to plan (unusually for me), but again I converted it to tail dragger and EP using a 4250 + 4S + 13 x 8 combination, giving a 4.5 lb flying weight.

Frog's 'Mustfire' 1965 design was my choice for 2015, being semi-scale as the name infers. It has got the 'looks' but is less accurate to fly than the former examples in standard form. So the semi-symmetrical aerofoil became symmetrical and the tail moment longer, with larger rudder and ailerons. Power is by a 4260 + 6S + 15 x 6 combo, giving a 6 lb flying weight.

Most recent is another 'Upset II', this time using a 1973 HB61 utilising similar mods to

those employed on my first model. I guess it's no coincidence that my Loaded Dice design bears more than a little similarity to this successful 1960s model aeroplane.

**Make Your Own Kit**

Creating a model from a bundle of balsa and a few pieces of ply is most satisfying and the classic 60 size aircraft lend themselves perfectly as they are comparatively simple, inexpensive builds, providing the





Pit area at RAF Bardney in 2013



Fancy something a little more modern? How about a Challenger from the 80s?



The author's classic aerobatic 'collection' in 2015



TW's Upset from 2013



Upset II landing



Terry likes the Upset II. Here is his 2016 version



Upset II is fitted with an HB61 from 1973



Turnout at a typical retro aerobatic event. Why not join in the fun?

encouragement to begin enjoying the model building process. With new technology allowing the use of laser cut parts, wings can now be easily constructed by almost any modeller. The tailplane/fin/rudder need not be built up but can be shaped from 1/2" soft balsa sheet, a far swifter method. By choosing balsa grades your model can be very light or more robust, depending on your ability or flying field.

A search of the Internet will reveal many

more designs to tempt you. Check out the Kwik Fli Mk III on the Outerzone website: [www.outerzone.co.uk/plan\\_details.asp?ID=7431](http://www.outerzone.co.uk/plan_details.asp?ID=7431)

**Join In**

There are events nationwide and this year there may be the introduction of simple competition elements within some events. But, in general, the events are meetings for aerobatic enthusiasts. Classic Aerobatics

will evolve to suit the requirements of its members, not any schedule imposed upon it.

For more details and a list of events please visit the UK Classic Aerobatic Association website: [www.ukcaa.org.uk/Events.htm](http://www.ukcaa.org.uk/Events.htm) The only criteria is to fly a pre-1996 design, before the FAI increased the model size to 2 metres. They are an inexpensive alternative for aerobatic enthusiasts.

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# Ninja

JR Propo enters the quadcopter battle with the aerobatic Ninja. Although not complicated, the kit needs some assembly so we asked heli expert Dave Wilshere to take on the build



The popularity of four-rotor craft – quadcopters – has grown exponentially over the last few years. They offer many of the qualities of a helicopter, but with multi axis gyros that make them super stable, easier to learn on and more relaxing to fly.

Before quads burst onto the scene, if you wanted to learn to fly a rotary winged machine there was a good chance you would suffer a few spills. With helicopters this means a long rebuild and quite a few parts required.

Quads are simpler, so by their nature are made of fewer parts, so crashes rarely break more than a prop or an arm. Repairs can be performed quickly with minimal tools. Initially quads were all about stable platforms with obvious uses as a camera platform. Other than as a work horse, this can become boring quite quickly and I'm sure there has been a good number of quadcopters bought that are now sitting on a shelf unused. What was needed was to pep things up, just like the path model helicopters took.

The first 3D quadcopters released back in 2013 featured a complicated collective pitch system to allow inverted flight (and transitions). Such is the speed of development, a year later the first fixed blade 3D quad was released. Special motors and ESC's were developed, where an instant change in the rotating direction allowed the fixed blades to go from positive to negative

lift. And being a much simpler solution it was quickly adopted by other manufacturers.

The control inputs are matched between quads and radio control helicopters, so obviously they will share a following and it was not a surprise to see companies known as helicopter manufacturers starting to offer quads.

## Enter The Ninja

JR was the first major manufacturer to adopt this system and it released the Ninja MR 400 late in 2014, the 400 relating to the distance in mm between motors. As expected their offering was assembled on a high quality carbon fibre and aluminium frame, like many of their helicopters. This is encapsulated by a multi-coloured polycarbonate bodyshell; the design is printed on the inside of the clear Lexan and the material's thickness provides a deep high gloss finish that won't scratch off!

The Ninja shouts quality, with little touches like JR moulded into the rubber arm end caps and a clip in, quick release battery mounting plate. The two piece body is held in position by grommets fitted over body posts, complete with retaining clips.

Neither half of the bodyshell needs removing to replace the battery so changes take a few seconds. Most quads have the heavy battery mounted in the centre, to maintain balance, but JR has overcome this

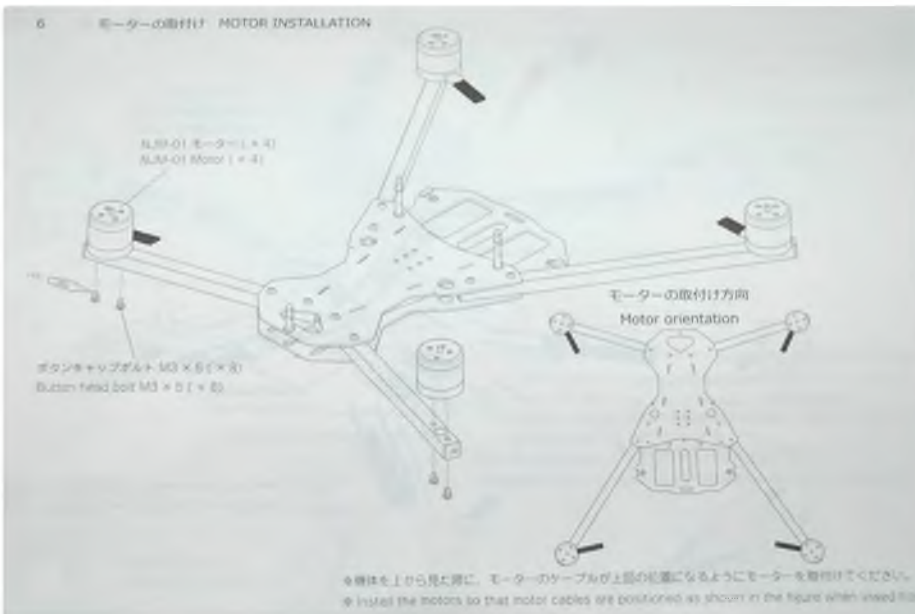
with some clever design thoughts. The Ninja is designed for the popular 3S (11.1 V) 2200 mAh LiPo battery.

Many quads feature equal length arms but for 3D this makes orientation difficult. JR made the forward arms shorter and the rears longer, helping with orientation and also allowing the flight battery to be mounted at the back of the frames and still achieve balance. The added bonus for an aerobatic quad is the rear mounted battery helps keep the Centre of Gravity low.

Designed to use JR's DMSS system, you will need a transmitter with suitable XBus software. There is a list of all the JR DMSS transmitters in the manual, noting the required software version. Earlier radios may need updating, which is easily done from JR's website. My XG-14 transmitter already had the correct software so it was an easy job to work through the settings listed in the manual. Follow these to the letter – this ensures success!

You can buy the Ninja in various packages with and without a suitable receiver, MacGregor also offer a package including an XG-6 transmitter. The review example came without a JR DMSS receiver but included one of MacGregor's new signal converters – more later. I selected the recommended 712BX DMSS receiver.





The instruction book features clear drawings

**Assembly**

The manual is only 18 pages front to back and the main assembly pages cover the first ten. There are no photos but the 3D drawings are probably clearer than pictures would be. The only tools needed for assembly are two Allen drivers, 1.5 and 2.0 mm.

The chassis is quite simple, with the four square aluminium box section arms clamped between two carbon frame plates, with two carbon spacer ribs.

The carbon parts are so cleanly cut and drilled that you don't need to do any work to the parts before assembling. But as always with carbon fibre, and particularly close to where lots of wires are running, it's worth removing the sharp edges with some fine wet and dry paper. Do this in a sink or bowl of water to stop the dust.

The hardware is all packaged together, so having a container you can empty the screws and clips into keeps them safe. I used a plastic servo box. Luckily there are not many screw types used so it's easy for someone with a good eye for size to pick them out as needed. Otherwise a ruler will be useful.

Assembly starts with attaching three body posts to the upper frame. Thread lock is

provided in the kit but as always with small screws going into aluminium parts it should be used sparingly. A spot no larger than the screw diameter is needed.

The lower frame has two body posts and the battery retaining slide blocks are fixed to the lower frame plate. JR has thought about the assembly process, and later repair time, by doing away with fiddly, easily lost nuts. They are replaced by CNC machined dog bone shaped arm nuts, which are fixed to the carbon plate by an M2 cap head screw. The upper frame has three body posts fitted and that's the frames ready to assemble!

The square section aluminium arms are prepared by gluing the rubber end caps to the outer ends; I used ZAP-a-Gap CA.

Assembling the frames with the brace ribs slotted in position, the four arms are clamped in position with a total of eight screws. Writing this section took longer than assembling them!

Before fixing the four motors in position it's worth noting the wire orientation required so that the wires clear the bodyshell. The motors have a traditional cross pattern with unequal mounting centres. The mounting holes are slotted to facilitate this.

**Electronics**

The only soldering required in the whole assembly is to attach your chosen connector to the main control board power wires. I used a Deans type connector to match the batteries I had available.

When it came to installing the electronics I started with the flight controller. This contains the gyros and the control outputs to the four ESC's. It's important this is installed square to the quad's centre-line, even though it's mounted off to one side. The manual gives a position back from the front edge of the frame, but no offset. The important points are it must clear the bodyshell and also leave room for your chosen receiver.

I fitted a DMSS RG712BX receiver that is almost the same size as the flight controller, so it was easy to space the two boxes either side of the centreline. JR introduced two, 6-channel X-Bus compatible receivers recently and these would also be a good choice.

Before the wiring on the arms can be tidied the motor directions need checking. I attached the double-sided tape to the ESC but left the protective film on the double-sided tape and just used the Velcro straps to retain them while the motor directions were checked.

The BEC, power control board needs fitting on the underside and again a position back from the front edge is given. This is important so that the low voltage LED sits under a clear window on the lower body.

With the control board mounted the ESC power leads can be plugged in. It's still not worth tidying the wiring until the motors have been run and the ESC's fixed.

Before fitting the props the motor direction needs checking because it is difficult to note the direction of the all black motors when turning, JR recommend adding a piece of tape to the motor bodies.

The next step is to bind the receiver to your transmitter, which should have been pre-programmed with the settings included in the manual. Again, follow these precisely – they work perfectly!

The manual and set up guide show the relevant motor directions. As is common practice, if any of the motors turn the wrong direction then simply swapping any two of the three motor wires will change the direction.

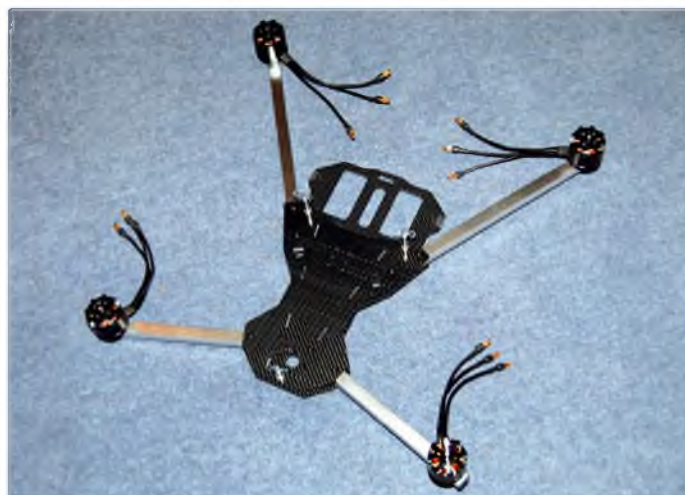


The clam shell type body comes factory painted and trimmed. It fitted perfectly





Basic frame and arms assembled ready for the motors



Motors attached ready for electronics



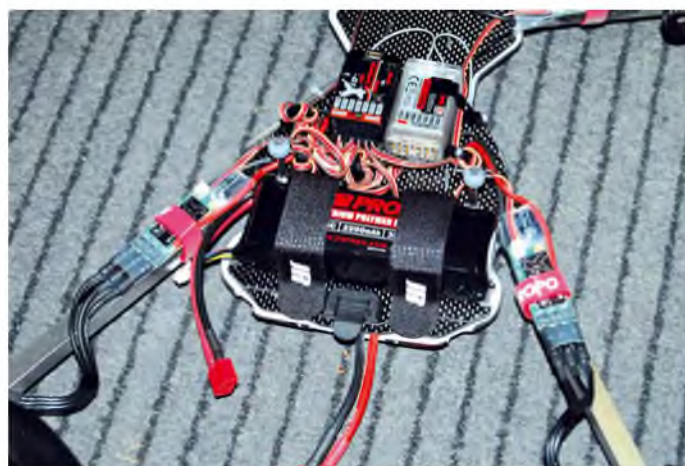
Lower half fitted. You can see how perfectly positioned it is from the box



Even the ESC straps shout JR's proud stamp of quality



Installation complete, ready for binding and then motor direction testing



Battery plate clipped into position. The plastic tab locks it in position; press and pull to release

When you do the motor test the throttle stick is moved the smallest amount to start the motors; 1 mm too far and they stop!

Once all the motors turn in the correct direction the ESC's can be fixed to the arms with the double-sided tape and the Velcro straps fully tightened. It's worth fitting the top body during this stage to ensure that the wires stow neatly in the top cover.

Screwing the props in position completes the assembly process. The numbered labels not only provide information on which prop goes where but the label also denotes the top face of the prop.

Overall the assembly is very straightforward

and quick. A suitable day for a test flight and flight photos arrived the day after it was finished. Meeting at the local club field with Stevie, who gets lumbered with taking most of my review flying shot pictures, he had an added use, as he has experience of the Ninja.

Slotting a JR 2200 3S 25C LiPo into the battery tray, the pack was clipped in position and throttle hold activated before plugging the power cables together. The quad should be on a level surface when the gyros power up.

The first ascending tone of three beeps is followed by a descending tone of four beeps,

confirm that the motor arming is complete. Do not move the Ninja during this time.

Placing the Ninja a safe distance away, remove the throttle hold and open the throttle stick 1 – 2 mm only. Wait for the motors to stabilise and the flight controller to 'lock in'. This takes around 3 seconds and after this time you can close the throttle completely and all four motors continue to turn at low rpm. If you need to stop the motors you must operate the throttle hold switch, so it's worth assigning it to a switch that is easy to operate. I fly Mode 2, so I keep the throttle hold and flight mode/stunt switch on the left hand side of the Tx.





Props fitted for test flying. The residue you see on top of one black prop is from the prop number sticker that also denotes the top



Hovering nose in is easy



Rock steady in Normal mode. The 6-axis gyro keeps the Ninja stable



Switching into Stunt mode the motors now reverse below mid stick and you can roll or flip inverted!

Opening the throttle stick smoothly to the centre, the Ninja lifted off and sat in a pretty stable hover. It was much quieter than I expected. Adding a little roll trim had it sitting perfectly still. Yaw control is accomplished with the rudder stick, speeding up and slowing down pairs of the motors. A couple of pirouettes and the Ninja was stopped nose in for some pictures. Anyone with some helicopter experience will find the Ninja very comfortable to hover.

With the first stage of flying shots complete the Ninja was moved off into forward flight. The nose has to be pushed down quite a long way to get the Ninja travelling but it remains smooth and steady. Being quite small and with my ageing eyes, I did not venture too far in any direction, but on a longish run down our club patch it does look a bit like a bat winged skydiver!

Coming back into the hover a few full power climbs were completed. It certainly gets a shift on, even in Normal mode. Coming down

to a safe altitude the Flight mode switch was activated and a small climb and throttle reduction confirmed the motors started to slow as the throttle stick approaches the middle. Punching the throttle and pushing in down elevator flipped the Ninja inverted. It's important to pull the throttle stick back at this point so the motors reverse and the Ninja stabilises in an inverted hover.

Pulling back on the throttle stick increases the rpm, with the motors running in the opposite direction to when it's upright and it climbs out inverted with the same zest it did the right way around – it's amazing! Having an average 3D repertoire with a helicopter, I was able to experiment with sideways flips, left and right, then forwards and backwards.

Around this time the timer started to count down, so I flipped it upright and remembering to switch out of stunt mode, I brought the Ninja around for a gentle touch down in front of myself. Activating the throttle hold switch stopped the motors and I retrieved the Ninja

and unplugged the battery. I had a grin from ear to ear! It really is fun to fly and amazingly clever.

After a post flight cuppa, I had another flight. My flying style allowed a safe four minutes of aerobatics on the 2200 mAh capacity pack, leaving a safe level in the cells. If you are more accomplished (or heavy handed!) the flight time might need reducing. I have friends with the Ninja and they get 4½ minutes flight time, but obviously being a quad it does not glide!

The Editor asked me if I was a quad convert after this. I'd mentioned that they didn't float my boat just hovering around. But this model offers so much more, and should you like the idea of quad racing or filming, JR now offer a GoPro mount. They have also introduced different colour bodyshells and coloured props, so your model does not have to look like your mate's Ninja.

**RCMW**



### Battery Power

I used JR Propo 2200 3S (11.1 volt nominal) 25C Lithium Polymer flight packs.

There are dozens of different manufacturers offering lithium polymer (LiPo) packs and many will almost certainly be manufactured in the same factories. This does not make them all equal though! Think of how many thousands of individual cells are manufactured each day to keep up with worldwide demand; these cannot all be equal.

Also the C rating stated on packs varies greatly from what you can actually draw from a battery. Some manufacturers will stretch the truth, gaining sales from a bigger number. Again experience has proved to me that you need to take some of these claims with a pinch of salt.

When JR Propo put their name on a product you expect high quality. Initially I was surprised these packs were only labelled 25C, but that is constant discharge. So it would allow a 55 A constant draw, in the real world a very short flight (not much over 2 minutes).

JR don't give a peak, short time current burst capability, but you can be sure its above the 55 A constant figure, so more than enough for real world flying and the spikes this Ninja might produce at full power draw.

What this tells me is the pack is probably the same as other brands' 30C, and flying has shown that the 2200 mAh capacity might be understated too. It's reassuring that JR are not trying to pull a fast one!

I have quite a few cycles through my first pack now and its staying nicely in balance.



Capturing the Ninja mid-flip takes skill. Steve Roberts did a great job with the camera!

### Electrospeed Signal Converters

When the Ninja was first released the flight controller was designed to work with JR's DMSS XBus system only. This limited who could enjoy the excellent quality and amazing 3D flying qualities.

MacGregor Industries realised this early on and through their own team of electronic boffins started to develop Signal Converters. Targeting two of the popular systems that might be used, they developed Futaba S Bus to JR's XBus converters, and also Spektrum DSM-X to JR XBus converters.

The early JR 2.4 systems shared technology with Spektrum, so this also allows people with earlier JR DSM2 2.4 transmitters to operate a Ninja, and also JR's helicopter flybarless system, Mini Tags. These are very small compact units, so are easily installed.

MacGregor supplied a Spektrum DSM to XBus converter with this review model. In addition to this, two DSM-X satellite receivers are required with leads (the shortest available are ideal).



The camera speed was the same for all shots, so you can see when the props were reversing

Left: First flight complete



## MODEL WORLD

### MODEL INFORMATION

<b>NAME:</b>	Ninja
<b>MANUFACTURER:</b>	JR Propo
<b>DISTRIBUTOR:</b>	MacGregor Industries
<b>WEBSITE:</b>	<a href="http://bit.ly/1pgjIP">http://bit.ly/1pgjIP</a>
<b>PRICE:</b>	£329.95 SRP
<b>MODEL TYPE:</b>	3D Quadcopter
<b>PARTS SUPPLIED:</b>	Assembly Kit, Propeller Set, NJM-01 Motors, NJA-01 ESCs, Power Control Board, Flight Controller
<b>PARTS REQUIRED:</b>	XBus DMSS receiver and JR DMSS XBus Compatible transmitter, 3S 2200mAh battery
<b>WIDTH:</b>	400 mm
<b>HEIGHT:</b>	70 mm





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# Scale Soaring

Chris Williams adds electric motivation to his new Slingsby Dart



Author's Bergfalke IV caught in action at White Sheet  
Triplet plan number: MW 3750 (Barry Cole pic)

As I may have mentioned last time around the success of my pal Motley's electrified K8 set me to thinking about the then newly-started project to build another Slingsby Type 51 Dart 17R. My original 1:3.5 scale plan was published quite a few years ago now, since when I have built another third scale version. Alas, old age is starting to make its presence felt and chucking large models off the hill in light winds (my favourite conditions) is a process that's starting to strain the old thews and sinews a bit.

The Dart was just about the last of the traditionally-built wooden sailplanes from the Yorkshire based Slingsby concern before they started flirting with that new wonder material, fibreglass. There are many examples still in existence, with a wide variety of colour schemes on offer.

The first thing to notice when construction commenced was the glaring disparity between the accuracy of an old hand-drawn plan such as this and the plans that I produce these days via the wonder that is CAD. This was most noticeable when I decided a couple of years ago to build another Type 13 Petrel from my old plan. The wings, designed and built in the last century, had the ribs produced by the old 'sandwich method' whereby balsa blanks are fitted between two metal root and tip rib templates and sanded flush. Hard to believe, isn't it?

The resultant ribs were then laid on a blank space on the plan and drawn around with that reliable Stone Age tool, the biro, thus forming the basis for future construction.

This time around I used a wing-plotting programme, Compufoil, and when the resultant wing ribs were produced they were laid on the old plan for the purposes of comparison. Rather to my surprise they had very little in common, with some very wide discrepancies. The surprising pay off is this: there is nothing to distinguish between the old and new models when it comes to flying characteristics, with both flying very nicely indeed.

So, a similar approach was made to the Dart. This time, in order to avoid the hassle of making up tapered spars for the wing, I used my current method of using 6 mm square spruce spars, with a sub spar inserted over the first half of the wing after the basic construction was completed.

Once again, I re-plotted the wings ribs in Compufoil and it's here where the seeds of disaster were first sown. The wing planform has a highly tapered panel for the first four ribs and I set up the programme as a two-panel wing. The section had to taper from 14% to 12% throughout the length of the wing, and here lay the first problem: what would the section thickness be at rib 4, where the second panel started? I decided to keep the 14% up to rib 4 and let the taper commence from there.

Thinking no more about it I merrily went on my way and before too long the wing panels were completed in their basic form, without ailerons or brakes. The fuselage having been built previously, it was time for that most magic of moments – the first rig in the garden. (I can't rig in my workshop as there's not enough room to swing a Manx cat.)

Mmmm... nice, I thought, as the Dart is a fairly pretty machine. As I walked around I came to the side view and then froze, looking on aghast. Where did all that dihedral come from?





Dart fuselage interior, glassed and ready for fitting the motor



The Dart reverts to scale with the prop removed



A folding prop is fitted to the business end



The pilot and instrument binnacle are easily removed to access the batteries. Note the animated control column



The model is rigged in the garden to check that it is ready to fly



Dart 17R is ready for its maiden flight

What lay before me was a glider that looked as though it was one loop short of the scrap yard, with enough dihedral to fly quite happily on rudder alone. It turned out that one subtle effect of having a constant thickness on the inner panel was to set the outer panel at another one-and-a half degrees to the dihedral angle already built into the wing joiner arrangement.

I will draw a discreet veil over what came next with the saw and the bin bag, but it was a bit of a black moment. Drawing comfort from the efforts of Robert the Bruce, I started over, this time just plotting a single wing panel and adjusting the first four ribs manually in my CAD drawing programme. This time I was met with success, but I must admit to a certain amount of nervousness when it came time for the first rig.

**Fitting The 'SUSTAINER'**

As previously explored, there are several ways of electrifying a glider. But for my money the least obtrusive is to fit it inside the fuselage, at the front, with just the shaft protruding, as Motley did with his K8. One of the high-end glass glider producers does this, but removes the tip of the nose, replacing it with a spinner. To my eyes at

least, this spoils the profile of the fuselage as the spinner can never exactly match that which was taken away.

I resolved not to do this with my Dart but the task seemed a little complicated, given that the nose is made up from ply profiles, filled in between with solid car body filler, and with some lead added to complicate things further.

As it turned out it wasn't that difficult, once a 10 mm hole had been drilled through the nose material and through the first bulkhead. Thoughts then turned to the subject of ventilation and here it turned out that the choice of the Dart for electrification was a serendipitous one indeed.

Looking through my voluminous archives I found a folder containing the restoration details of BXH, the full size version on which my original prototype was based. There, in black and white, well in colour actually, was the nose cone of the Dart sporting not one, not two, but three ventilation holes, ideally placed for the cooling of an electric motor. Not only that but the central hole had a length of tubing protruding out from the nose cone.

The upshot of this was that I was able to inert a piece of 10 mm aluminium tubing in

the centre hole to hide most of the propeller shaft, meaning that, with the prop removed, the model would revert to a nearly true scale appearance. Before that could happen though the motor had to be fitted with an extension shaft, and a bearing buried in the nose to support it. (With engineering support from my pal, Smallpiece.)

The motor itself was attached to a 6 mm plywood ring, the whole unit being epoxied in place with enough room for adjustment to allow the shaft to sit in the centre of the nose aperture. The 'R' designation on the glider's title refers to the retract: once this is fitted, and space made for the LiPos, there's not much room left for a tow release. But this is not too important as the Dart is destined for slope work anyway. For those that like the nitty gritty of the wiggly amps side of things, here are the specs:

- Turnigy G60 Brushless Outrunner 400KV
- Turnigy Brushless ESC 85A w/ 5 A SBEC
- 14 x 10 folding prop
- 2 x 3S LiPos

So, at the time of writing the maiden is but a few tweaks of the transmitter away. And then we will see what we will see!



### Mobius Update

Since my review of the little Mobius video/stills camera, I have arrived at the Mk III version of the mounts for the wings. Although the earlier versions gave good results they were a little fiddly to set up, so it seemed that a re-design was required. One of the problems with the Velcro retainers was: a) they were difficult to tension up, and b) the damn things kept sticking together!

So it was a return to the method of using two lengths of spruce sheet, one on each side of the wing and taped together at the back with good 'ol insulating tape. A substantial block of balsa sits on the LE with a V-shaped notch in it, and here's the trick: a short length of 10 mm ali tube is inserted, parallel to the wing's LE. This is taped either side, which stops the camera from wobbling sideways, thus doing away with the wire stop. Another wrinkle sees the ali tube that carries the camera angled towards the fuselage in order to avoid the stand itself being in the shot.

One thing that came to light with the mount that elevates the camera above the fuselage, is that on some models you can see the pilot's hands. Thus it is that if the pilot's head is moving but the stick is stationary, some of the effect is lost.

So on the Dart, I resolved to do something about it and the solution was relatively simple. A servo was taped to the cockpit floor in the appropriate position and the control column was screwed to the servo arm. As we don't want any over-large movements the servo has its own channel, thus allowing the movements to be suitably limited. This is the situation at the time of writing, the only problem being that with only eight channels the brakes have had to go on a Y-lead. And now one is up whilst the other is down!..



Parts for the Mk 3 Mobius stand. The short transverse tube is taped to the wing LE



The 'high' camera mount being used on Smallpiece's 1:3.5 scale Bergfalke II 55

### World Record?

I don't know how world records are formulated but on behalf of Smallpiece, Motley and myself, I'm claiming a record for the largest assembly of Bergfalques on one slope at the same time. These consisted of Smallpiece's new scaled up version of the II 55, my Mk1 MU13e, and both Motley and

my Bergfalke 4's. Given the generally flying-unfriendly weather we are experiencing on a long-term basis, we had a splendid day – so much so that it took the next two days to recover. With the first of the White Sheet scale fly-ins rapidly approaching I sincerely hope that it can happen at least once again...

(To see the action for yourself, Google: One Hill, 4 Bergfalques) **RCMW**

### CONTACT

c\_williams30@sky.com



World record attempt – four Bergfalques on one slope!



Two of the Bergfalques in loose formation





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# Cowl Fixing

## Get It Right First Time

Chris Bowler offers a simple solution to lining up an engine cowling's position



DB Models Auster with cowl fixings and openings shown in flight

Virtually every model has one – a cowl that is! And there is no way to avoid that final and somewhat daunting moment of drilling your pristine ARTF or home produced fibreglass cowling.

My tried and tested method of locating the holes for the fixings, and how to achieve the perfect match, is described here. I wrote this article after a friend asked me to lend a hand with a large model ARTF that had pre-positioned and fixed mounting points for the cowl in the fuselage.

After seeing how it was done, and quickly, he was mildly surprised at the simplicity and ease of what can be quite a daunting task, especially for a novice builder.

### Tools

Nothing fancy is required. A supply of sturdy card (cereal boxes work very well), dividers, a pencil and a straight edge (a steel rule will do the job). You'll also need a scriber, or a piece of wire with an end ground to a point will substitute, to pierce holes. Also required

is some masking tape for positioning the template. You will also need a wheel brace with twist drills to make pilot holes and a larger one to make the final clearance hole. It is also prudent to have a small round file to hand for any minor adjustments that may be needed.

### Method

Fitting the cowl is usually one of the final jobs on a model project and is best done before painting the cowl. However, with an ARTF you have no choice here as it will inevitably be pre painted and care must be taken. In this case check and check again before any drilling. There is no going back!

I was always taught to never, never assume anything, but here I assume that you have accurately aligned and fitted the engine with appropriate side and down thrust incorporated. You have? Good...

Depending on the power unit there will be items that will protrude from the cowl and it is a good idea to remove the needle valve and

exhaust on IC engines. Electric motors need neither of these so that's two possible holes eliminated!

Offer up the cowl and eyeball check where the propshaft will emerge, then drill a close clearance hole in the front of the cowl and offer it up to the fuselage again. It should be a snug fit to the firewall bulkhead and overlap it by about a 1/4 of an inch (about 5 mm for you metric maestros!) This should be equal all around the edge of the cowl. To make sure it is mark the top of fuselage with a felt tip pen; use dividers to obtain the distance from the bulkhead to the cowl edge, then transfer this to the sides and bottom of the cowl. This will allow an accurate and eye-pleasing line to the cowl edge and fuselage mating.

While doing this it may become apparent that the hole drilled for the propshaft is not quite accurate; side and down thrust will be affecting it. Enlarge this hole to make sure that the cowl can slip easily over the propshaft and that it fits to the alignment



## GOWL FIXING

marks you just made on the fuselage. Most importantly ensure the cowl goes on far enough beyond the fixed captive nut points to give adequate room to drill the required holes. That will take a little experimentation and involve fitting the cowl a little further back.

On larger models I use hardwood blocks, drilled to take flanged screw inserts, then mount these in the blocks, which are then screwed to the firewall with recessed screws (all available from [modelfixings.co.uk](http://modelfixings.co.uk)).

The next step is the critical bit...

### Alignment And Template

Most models use four fixing points to secure the cowl. Others, especially scale models tend to use more. This system may be used for both but obviously greater care and accuracy is needed when more points are required. The full size has eight fixing points, so accuracy on the model is vital. The cowl was produced for me by Sid King. Further holes will be needed to accommodate the replica VW engine, which is yet to be made!

On ARTF models the covering will probably obscure the fixing points. Simply rub a finger over the likely spot, shown in the instructions, and the resulting small indent will give you a guide to the position. Using the scriber or wire, pierce the covering carefully then locate a fixing screw and test fit it in each of the holes. Remove it and you now have the exact size and position of the screw points. On some models this may simply be wooden blocks into which wood screws are used to fix the cowl, in which case mark the centre of the block and extend that line back to the fuselage to act as a guide.

Cut a piece of cardboard large enough to overlap the cowl and the front of the fuselage. Cut a second piece that is large enough to fit the front of the firewall and secure this with masking tape to the fuselage, but BEHIND the exposed fixing holes. Draw an accurate line from the fixing hole centres back to this card and mark it clearly.



Drilling holes in hardwood for the flanged inserts



The insert is screwed in with an Allen key



Ground down screw heads to fit the recesses. In the centre is the original screw



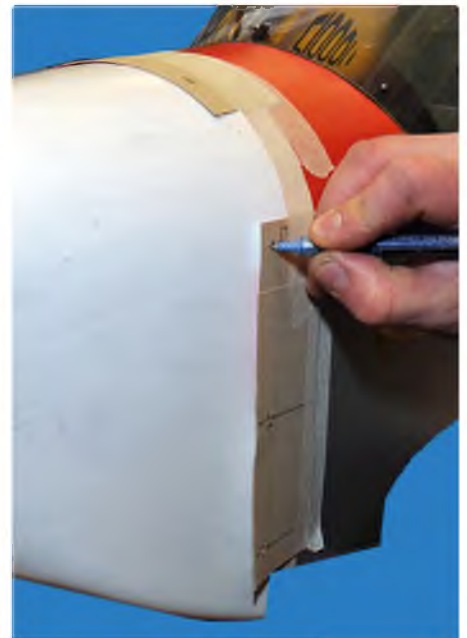
Block mounted to bulkhead



Measuring centres for the template



Template marked up and pierced. Test for accuracy before taping to the fuselage side



Marking cowl through the template



### Measure Centres

Using callipers (dividers) accurately measure the centres of the screw fixings on the fuselage, then transfer the measurement to the first piece of card. Pierce the card with a hole large enough to take the fixing screw or bolt. Hold the card in place and check that the pierced holes line up with those in the fuselage. Once sure, using masking tape, secure the template in place on the fuselage over the card template fitted earlier, ensuring that the holes line up accurately. Having

the actual template taped over the previously affixed card means the cowl can be slipped into place easily, with an allowance for the cowl thickness.

As described this method is for one side so do exactly the same for the opposite side and tape it all in place.

Before sliding the cowl into place, stick some masking tape onto the areas that will be drilled. This helps prevent damage when the drill is applied to the plastic/fibreglass cowl.

Slide the cowl into place, carefully ensuring that everything is accurately placed, then mark the hole centres through the card template. Check and double check to make sure the cowl is fitted correctly, with the propshaft protruding at the front.

When satisfied drill the pilot holes and check the fit again, then open up the holes to suit the fixing screws or bolt sizes. If all has gone well you should be able to remove the templates and fit the cowl. A pleasing moment...



Cowl drilled and being checked for alignment. A small round file may be used to adjust minor inaccuracies



Final check with prop in place



Finished cowl in place. It was painted only after all the holes had been made

### Other Holes

Now you can check the front of the cowl and see how the propshaft exits. Mark out an accurate hole with felt tip pen using the prop driver on the shaft as a guide to ensure it is in the centre of the hole. This may look a little odd, but remember there is offset for down and side thrust. Open up this hole with a Dremel sander drum or similar and you will have a neat aperture.

That finishes the actual fitting of the cowl but there will need to be other apertures,

depending on the model.

Remove the cowl to reveal the engine and tape a piece of card to the fuselage that lines up with the position of the needle valve centre and pierce the centre position in the card. At the same time fit another piece of card to give the position of the exhaust exit, for upright engines on the side and for sidewinder mounted units on the bottom. The layout of engines varies, note the Laser in the accompanying image, so each cowl will have to be tailored to suit.

Draw the rough shape on the card, remount the cowl and check for positions. Again mark the cowl and remove it for drilling. Drill an oversize hole to accommodate the needle valve and a series of holes in the shape of the manifold template, where the exhaust will exit. Remove the cowl and cut the hole for the exhaust. With constant refitting and checking of the cowl, open this up with a sanding drum to obtain a good fit. Remember to allow room to access the fixing bolts for the silencer.



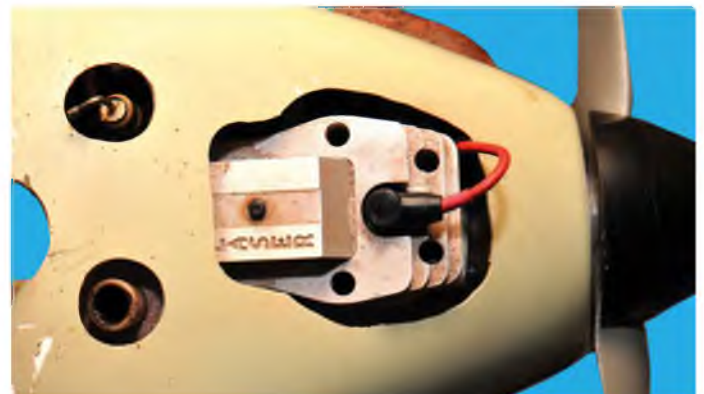
Cowl openings were cut with a Dremel sanding drum, using the template method as described for marking the retaining screws. Accurate and neat



This model has a petrol engine. The mesh is to stop foreign objects from being drawn into the trumpet and it looks better than a 'black hole'



This is a replacement cowl fitted to a Seagull Cub. The screws are out of line as I had to use existing mounts on a damaged airframe



This is the underside of a Phoenix Hurricane with a Laser fitted and showing the exhaust and needle valve apertures



**COWL FIXING**

**Good Result**

With care, patience, constant checking of the fit and size of the holes, you should end up with a really good result. With ARTF models that is the end. On kit or scratch builds the cowl can now be painted to suit.

I have one further thought here; reading and digesting this could take longer than actually doing the job! Use the article as a reference when fitting your own cowls.

Oh, one final thing... Use washers under the screw heads to protect the cowl. On some models I have opened up the fixing holes to take a suitable grommet, which the screws then pass through, this gives a little cushioning to eliminate any vibration. Not an essential but worthwhile on models that may have more vibration from their engines than others. **RCMW**



**Left & below:** Full size cowls can be quite complex. These two images are of a Chilton DW 1 cowl fixing and hinged top cover. It would be a challenge to make one in litho plate for scale modellers



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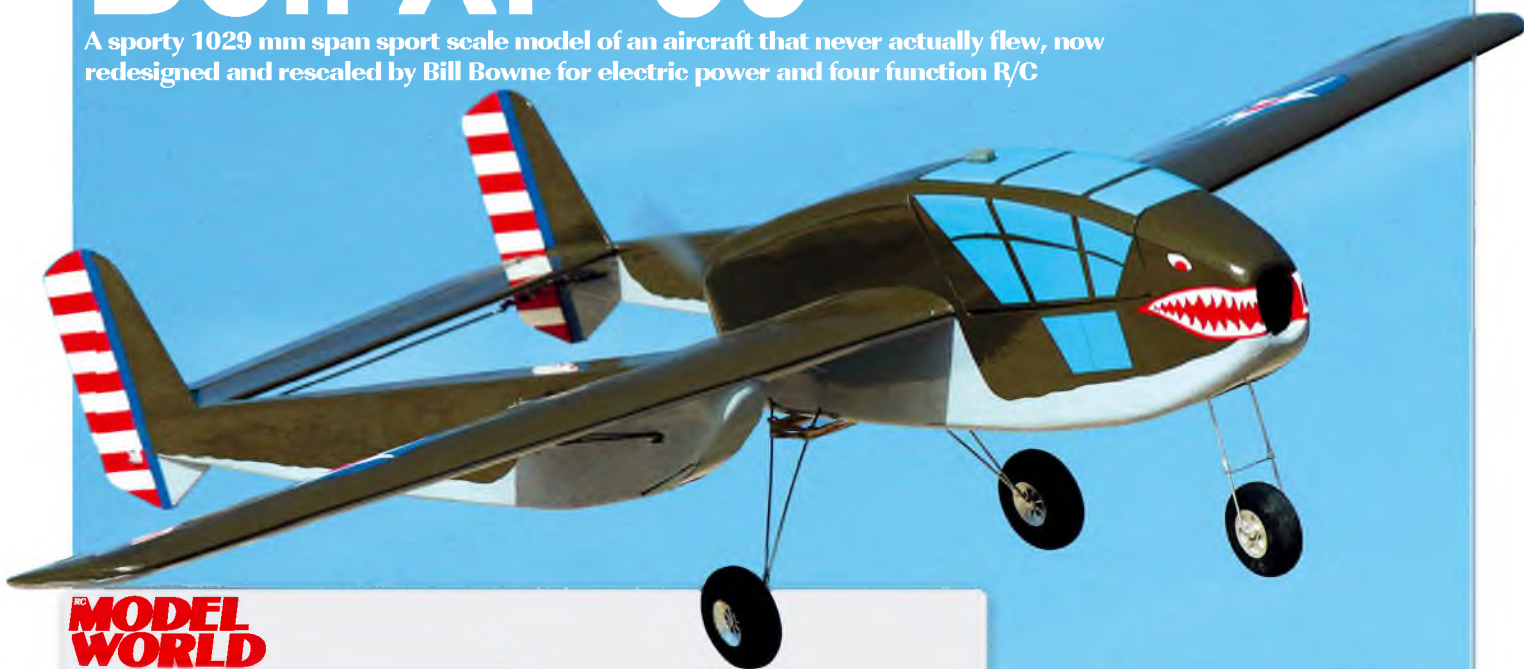
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# Bell XP-59

A sporty 1029 mm span sport scale model of an aircraft that never actually flew, now redesigned and rescaled by Bill Bowne for electric power and four function R/C



## RC MODEL WORLD

### At A Glance

<b>PLAN NAME:</b>	XP-59 'Belle'	<b>LENGTH:</b>	38¼ in (972 mm)
<b>MODEL TYPE:</b>	Electric sport scale	<b>MOTOR:</b>	D2826-6 2200KV brushless outrunner
<b>SCALE:</b>	1:12 approx.	<b>ESC:</b>	E-flite 30 Amp switch mode
<b>MATERIALS:</b>	Balsa, spruce, plywood and lite-ply	<b>PROP:</b>	APC-E 6" x 4"
<b>WINGSPAN:</b>	40½ in (1029 mm)	<b>BATTERY:</b>	3S 1800 mAh (35C) LiPo
<b>AREA:</b>	288 sq in (1858 sq cm)	<b>SERVOS:</b>	Hitec HS-55
<b>WEIGHT:</b>	29 oz (822 g)	<b>RECEIVER:</b>	Small 4-channel
<b>WING LOADING:</b>	14.5 oz/sq ft		



### Full Size Design And Development

Poor Bell Aircraft Company; they designed several radically different aeroplanes in the 30s and 40s but success kept eluding them. Bell designed the YFM Airacuda to fit a requirement for a multi-seat escort fighter (basically a twin-engined flying battleship that would fly in formation with bombers and shoot down intercepting fighters with multiple

37 mm cannon). Fortunately, higher-ups in the US Air Corps realised that whilst Bell's execution was good, the concept itself was poor. (Think of a giant Boulton Paul Defiant!)

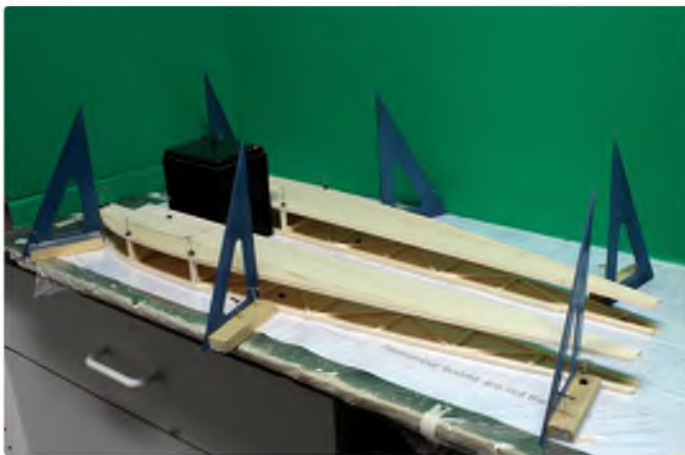
Likewise, their P-39 Airacobra. At a time when two to six .30 calibre machine guns were common, it stocked not only those peashooters but also a 37 mm cannon. Plus, it had tricycle landing gear to ease

ground handling and a mid-fuselage engine placement to enhance manoeuvrability. Sadly, the turbo-superchargers that would've given it a chance to fight above nosebleed altitudes were ordered to be deleted. The net result was another failure for Bell.

The Air Corps put out a call for radical designs based around new, equally radical engines. Bell's answer was a pair of twin







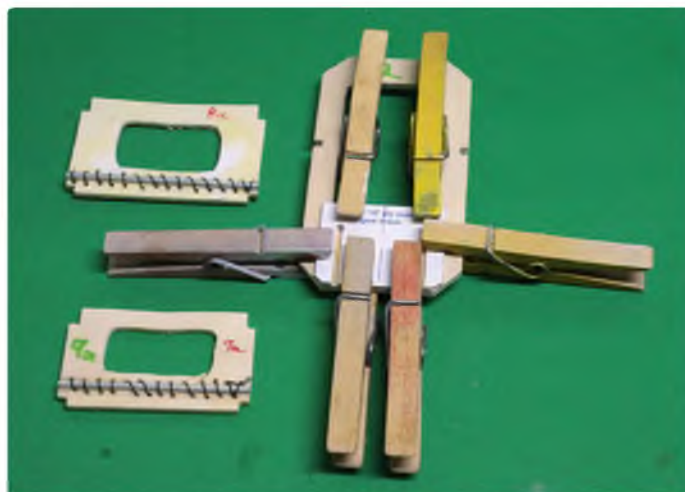
Start by making two mirror-image booms. Do both at once and it will be harder to accidentally make two of the same boom



The most obvious differences in the two booms are the angles in the top sheeting and the lengths of the sides forward of the spars



Use the booms as spacers for ribs W4 and W5/5a. Wrap in 'sandwich film' to keep from gluing them in place just yet



If you are using the removable landing gear, sew aluminum tubes to 8a and 9a with Kevlar fishing line, then soak with thin CA. Glue the 1/16" hard ply nose gear former to 2

boom, pusher designs, the XP-52 and the XP-59. The former was to use the Continental X-1400 but was cancelled when that engine never overcame its teething problems. The latter, a back-up design, was to use the famed Pratt and Whitney R-2800, but was also cancelled as it wasn't expected to be all that much better than existing R-2800 powered designs (P-47, F6F Hellcat, F4U Corsair).

Several other companies also responded to the RFP, amongst them Curtiss' XP-55 'Ascender', Vultee's XP-54 and Northrop's XP-56. Those, at least, made it to flyable (loosely speaking) prototypes. None of those were successful and all three went into the dustbin.

But when Great Britain gave the US its first jet engines, the Air Staff recognised Bell's ingenuity and gave them the opportunity to build the first US jet aircraft.

Problem was, hard info on the engines wasn't available when the design was drawn up. So Bell wound up building an overly conservative airframe. To keep the Axis powers from knowing we had a jet in development, Bell was told to use the cancelled XP-59 designation for the new jet-powered aircraft, calling it the XP-59a. The resulting aircraft, the Airacomet, is actually a pretty nice looking aircraft, with a very visible P-39 heritage. Sadly for Bell, though, it turned out to be too conservative so only a handful were built. Lockheed was told to take over the project. They, in turn, gave the

engines to Kelly Johnson's 'Skunk Works' team, who produced the long-lived F-80/F-94/T-33 series around the engines.

Bell finally got to carve its name in aviation history with their rocket-propelled aircraft, the X-1 (which Chuck Yeager took past Mach 1) and the X-2. Then Bell went to the dark side, building helicopters, carving out a very successful niche, which they still hold.

### Model Research And Development

Like many of us I'm fond of rooting for the underdog. So when I stumbled on a book of US fighter designs that included both built and purely paper projects, my interest was piqued. After all, there's a strong interest in the designs dreamed up for the Luftwaffe, had the war gone past 1945. Likewise, other air forces had 'what if' designs dreamed up (such as Vickers' six-engined canard Lancaster-ish bomber). If folks can build models of 'Luft 46' aeroplanes, why can't I build a model of a similar, never-built, US design? So, I hit the Internet and started researching the XP-59.

The first problem was the lack of information. Repeated searches turned up a handful of shots of the wind-tunnel model and a plywood mock-up, plus the three-view from my old book. Interestingly enough the drawings and mock-up photos all disagree. So I traced the three-view into TurboCAD and started drawing.

Oddly, I even found photos of a projected navalised version of the XP-59 that could

provide a cheerful colour scheme. But it made me think... Where did Bell plan to put the arresting gear? Anything blowing back into the contra-props could have made a real mess of American wooden carrier decks!

There are a lot of deviations from scale in my model, all intended to simplify building and flying. Probably the most obvious are the squaring off of the fuselage pod, moving the main gear to the fuselage pod, and going to a two-bladed prop instead of two counter-rotating, four-bladed props.

Figuring out a building process took quite a while. I used the flat building board surface to align the wing top, tailplane and booms, creating a one-piece model. That does make transportation more problematic but avoids having to build in all sorts of attachment bits (adding weight). Better still, it means the Bell can be taken from your car, a battery installed, and the plane placed on the runway, all in under a minute.

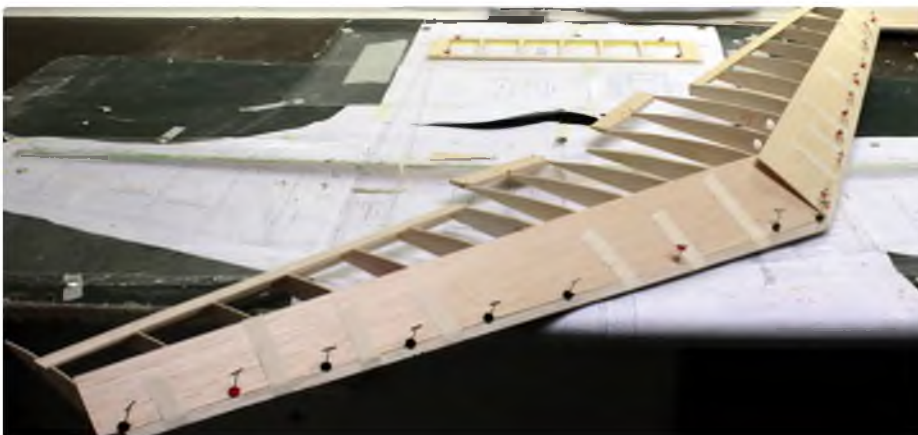
Speaking of 'the Bell', I've named the model 'the Belle of the Brawl' (Belle for short), because 'XP-59' frankly doesn't flow very well from the tongue!

I covered Belle with Doculam and sprayed her mostly silver, using a new can of silver 'rattle-can' paint. I planned to later spray the wing top yellow and the tail feathers blue, with the markings of the USS Enterprise's VF-6. I made up four 'star-and-meatball' insignia out of Ultracote and printed the squadron codes on clear labels.

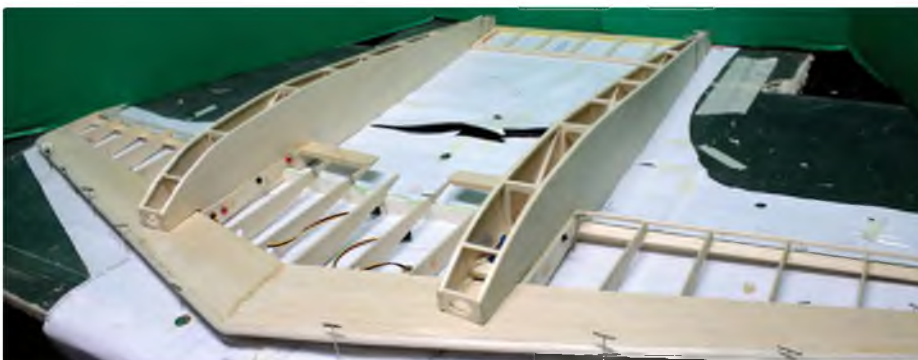




Sheet the underside leading edge before removing the wing from the building board. Moisten the wood to make it curl, then let it dry thoroughly before proceeding (slow-drying glues like aliphatic are superb for this task). All of the dihedral is in the wing bottom and the wing top is flat from tip to tip



Add the shear webbing in front of the spar, then sheet the top LE



The boom tops are flush with the wing top and the tailplane, all built flat on the board



Outboard servos each drive the aileron on their side. Pull the servo leads to the centre section, then sheet over them. Later on we'll cut access holes and pull them out

In the past I've prepped Doculam by buffing it with fine sandpaper and cleaning it with acetone. The brand of silver I used (DIY store stuff, not hobby paint) would hold pretty well after that, although most of the other colours would peel off if I tried masking it. This time though the silver refused to stick and, frankly, it looked pretty bad. So I skipped the yellow and just sprayed blue on the tail...

At least the can said it was blue. It looked blue in the store, the cap was blue, but the paint came out... periwinkle? It was sort of a purplish-blue, not a colour the US Navy would paint on a fighter! Then I tried to iron on the US insignias using a cool iron. Again, I've done this for years, but the new formula paint MELTED when I touched the iron to it, so I decided to finish the model and test fly it as it was.

I'll detail the maiden flight later; suffice to say it went well and the plane came home, intact. That same day I stripped the Doculam off the plane and started recovering it with Ultracote in the colours you see here – US Army Air Corps early-WWII olive drab and grey, with a 'Flying Tigers' type shark's mouth and red/white/blue rudder stripes. Happily, I was able to salvage the star-and-meatball insignia, saving me an afternoon of work. Totalling up the costs afterwards, I found the cost of the Ultracote to be not that much more than the cost of the paint, masking materials and Doculam. Plus the Ultracote produced a much nicer finish a lot faster (and it works much better for film hinges).

So, let's roll the calendar back to the early 1940s and start on our 'what if?' Belle. We will begin by building the twin booms.

### Booms

Match the servo trays to your servos. Add the 1/4" x 1/8" basswood servo tray reinforcements to the backs of the servo trays.

Lay out the skins in two pairs, top to top, making one left and one right boom. The inboard and outboard skins are **different**, with the top forward inboard skin area slightly longer than the outboard one. I strongly suggest using a marker to write on the inside of each skin its use as 'Inside Left', 'Outside Left', etc.

Mark the locations of the bulkheads (B1-B3) and 1/8" square verticals on the sides, then glue on the 1/8" square internal and peripheral framework, plus the stab braces. Glue the bulkheads and servo trays to the inboard skins, and then the outboard sides to the inboard ones.

Wrap scraps of 1/4" x 1/8" wood in plastic sandwich wrap. Sand the boom trailing edges to taper around the plastic-wrapped scraps, then (over straight lines) glue the boom ends together (the plastic wrapping keeps the boom ends available for the rudder posts). Add 1/8" square cross members between the sides, top and bottom. Sand the sides flush, sheet the tops with 1/16" cross-grain sheeting and sand flush with the sides. Taper the sheeting on the tops to match the sweep in the main spars. Leave the bottoms open, for now, to make adding the pushrods easier. We'll let the booms rest whilst we build up the tailplane and the wing.

### Tail Feathers

Pin parts S1 and S2 to the plans, then glue the 3/16" x 1/4" tailplane and elevator leading and trailing edges (LE and TE) to them. Cut





Frame up the fuselage pod the same way you did the booms...



...then cut out the hatch and separate the three sections (for now)



Once the pod is glued to the wing/boom/tail assembly it's time to cover and finish the gear installation



The XP-59's first set of 'clothes' was a covering of Doculam, painted with DIY store rattle-can paint. The colour scheme was based on photo of a desk model of the XP-59 in Fighting Six colours (USS Enterprise). That worked for the first flight but looked absolutely horrid



Belle, now in her hopefully final colour scheme. A 'what-if', heavily borrowed from early WW2 US Army aircraft, including a 'Flying Tigers' style shark's mouth



Make sure you feed your Belle only good LiPos otherwise she may seek other forms of nourishment!

and glue the 3/16" square ribs between the LE and TE.

When dry, remove the tailplane from the building board, round the LE and sand it flat, top and bottom. Sand a 'V' into the elevator LE and taper the elevator to about 1/8" thick at the TE (any thinner would be more vulnerable to hangar rash).

For the vertical fins, pin the 1/4" x 1/8" rudder post and LE to the plans, then glue on the V and R parts, followed by the remainder of the sub-fin, fin and rudder strip wood. Sand flat on both sides and bevel the rudder LE's to a 'V'. Pin the tailplane in place on the plans but set the fins and rudders aside for now.

**Wing**

We will build the wing upside down, around the booms and tailplane (but without gluing those bits into place until later).

Pin the wing jigs to the plans. The jig builds in washout, helping the XP-59 to resist tip stalling. Sand the boom/tailplane joints flat, then fit (but don't glue) the booms to the tailplane. Wrap the boom forward ends with sandwich wrap and pin them to the plans. Pin 1/16" scrap along the spar location, sand the spars to match at the wing root, glue them together and pin them to the plans. (Remember, the wing is flat on top; all dihedral is in the wing underside thickness taper.) Criss-cross the pins over the spars, please; don't stick them through the wood or else you will weaken those spars!

Glue the ribs to the spar, fitting the ribs against the booms, and add the bottom spar, leading edge and the 1/8" square outer wing bottom TE. Remove the booms and sheet the wing bottom LE, keeping the sheet rear flush with the rear of the spar.

Remove the wing from the jig and glue the

shear webbing to the front of the spar (grain is vertical). Then sand flush with the spar top and sheet the top of the wing. Sand the LE to aerofoil shape. Trial fit the booms to the wings, sanding the front tops of the booms to ensure the sheeted tops of the booms is flush with the wing top LE sheeting (that dihedral in the wing bottom amounts to about 1/16" thickness change from boom side to boom side).

Remove the 1/16" scraps from the building board and pin the wing back on the jig. Glue the booms to the wing and tailplane. Fit the servos and make sure you can run their leads through the wings, then remove them, add the centre-section TE and sheet the bottom centre-section. When dry, remove from the jig and sheet the top centre-section. Sand smooth and epoxy on the fibreglass centre-section tape.





Belle is nicely stable and very comfy on both high and low passes. Had the full-scale XP-59 been built, her six .50 calibre machine guns and dual 20 mm cannon would've made a frontal view of Belle an Axis pilot's last view

Belle will hold knife-edge attitude well but she won't maintain altitude. Please note: the US star on a wing always points forward. On a fuselage, one point always points upwards. It is as annoying to US modellers to see the stars backwards as it is for Brits to see the Union Jack upside down!



Landings are a non-event. Just throttle back and Belle will gently settle on her wheels



Belle is a smart looking model of the 'what if' aeroplane

**Fuselage**

If you are using the landing gear, use Kevlar fishing line (NOT monofilament!) to sew aluminium tubing to F8 and F9a, and then soak the line with thin CA. If you aren't, then delete the tubing and the nose gear parts.

The top and bottom sections of the pods are built simultaneously, but installed separately. Pin down two top sides and two bottom sides (top-to-top or bottom-to-bottom, to ensure only building one right and one left) and mark the bulkhead locations on each side. Glue the 3/8" tri-stock to the top and bottom fronts (razor cuts in the insides of the curves help), the 1/8" square perimeter and diagonal bits, and the wing saddles. Glue the 1/16" birch ply landing gear middle brace to F2, then install the aft plate and blind nut (the blind nut goes in F2; you'll access the bolt from inside the cockpit). Leave the bolt loose for now.

Glue bulkheads F2, F3, F4, F5, F6, F7 and F8 to a bottom side, then glue F6a, 7a and 8a to the top fuselage side. Glue F2a, F3a and F4a to the hatch bottom, then glue that to the same side. Sand the bottom of F5a so it fits the hatch bottom and then glue F5a to both it and the fuselage side. Glue F5b to the fuselage side.

Use thin music wire to punch holes in one fuselage side for the landing gear. Add the opposite fuselage side, gluing from F4/F4a to F8. Clamp the sides together at F1a and dribble thin CA in to glue the rest of the bulkheads in place.

Do likewise for F9/F9a but glue F9 only to the fuz top and F9a only to the fuz bottom. Mark the splits between F2/F2a and F5a/F5b on the fuselage sides, then sheet the top and bottom of the fuselage. Use the landing gear holes you punched in one side to guide the wire and punch holes in the opposite side.

Add F1, then carve and sand the fuselage to shape. Use a razor saw to separate F2 from F2a and F5a from F5b, then slit the hatch base loose from the bottom fuselage. Finish sanding the hatch and opening edges, and then add the spring hatch latch. You should now have three fuselage parts – bottom, top and hatch.

**Final Assembly**

Without the jig, place the wing assembly on the board, upside down, and glue the lower fuse to the wing bottom. You may have to elevate the building board to allow the top of F2 to clear; I let my model overlap the edge of my workbench.

One last time ("Yippee!"), remove the model from the building board. Sheet the aft ends of the booms, under the tailplane, and then add the fins and sub-fins, followed by the fuselage top and the firewall/F9.





A firm toss sees Belle safely into the air



Minus her landing gear and with the new 2200KV motor, Belle was a real challenge for photographer, Micki!



Strafing those blasted groundhogs! Seriously, just keep Belle on an even keel and let her settle, chopping power just before touchdown



The large front hole was the engine air and cooling intake. For us it's how we cool the ESC

Install the elevator and rudder pushrods, then sheet and sand the booms (leaving the space over the servos open). Tape the ailerons in place, install the aileron linkages and disassemble until after covering. Make up the hatches for servo access. (By the way, all hatches, top and bottom, are hinged at their leading edges with bits of covering heatshrink film.)

Use scrap block to fill between W2 and the fuselage side, and to build the engine cowling. Carve and fit blocks to the front of the booms and the wing tips. Please remove as much weight as you can from aft of the C of G! Add the wooden rudder interconnect horns before covering the rudder, but don't add the interconnect wire until after the covering job is finished. If desired cut lightning holes in the boom tops, fuselage pod and ailerons.

I found the shark's mouth insignia on a website. I resized the image, created red and white templates, and printed several copies of it. One copy for the white teeth and eyeball template, one for the lips and red eye!

The rudder stripes (seven red and six white on each, with red top and bottom most), the blue fin bars, and the 'star-and-meatball' US insignia were all cut from Ultracote/Profilm, (white disc, blue star outline, red ball, in that order). My 'Gyro-Cut' precision cutting tool from Traplet really helped here! Last, a little paint on the tops of the control horns kept their natural white hid against the olive drab surfaces.

After covering I hinged the control surfaces with CA (fluffy Mylar) hinges and added the rudder interconnect wire. Since the ESC

I'm using won't support four servos on a 3S pack, I wired a Dimension Engineering Park UBEC between the ESC and the flight battery. The UBEC and the main receiver are Velcro'd to the fuselage bottom, the satellite receiver is Velcro'd to the wing top LE, and the ESC is Velcro'd to the wing bottom over the belly hatch.

Finally, I balanced the model at 4½" (114 mm) aft of the wing LE at the fuselage side.

Control throws were set as follows:

Aileron:	+ 3/8" (up/down)
Rudder:	+ 5/16" (each way)
Elevator:	+ 7/16" (up/down)

### The First Maiden

This was off a damp gravel/sand runway. No prop damage but the ailerons were WAY out of trim, so I made a quick landing to correct that. The second take-off went just as easily. With the plane intentionally nose-heavy the stalls (as expected) were very tame and the model refused to snap or spin.

After landing for the second time and bringing the model in to check for loose bits, I found the rudder interconnect wire had fallen off, so I had only one functional rudder! The new interconnect uses a 'Z' bend on one end and a clevis on the other. Heavier, but not as easy to lose!

Subsequent flights (with the new colour scheme) confirmed that the model is stable, surprisingly fast, and very reluctant to spin or snap. As there is no prop blast on the wing, there is no prop-blast induced lift, so a bit more speed is needed to maintain good aileron control. Take-offs and landings are

a piece of cake, although taxiing without a steerable nose gear can take a bit of planning.

### Second Maiden

A few weeks later we took the Belle to a grass field, pulled the landing gear off and checked out how she flew without legs. That meant a hand-launch, not an easy thing with a 'finger-slicer' on the fuselage rear. So, I held the model by the booms and did the tossing, whilst an experienced Pattern-flyer friend did the piloting. Aside from needing the pitch trimmed a bit, the Belle showed no nasty habits and had a definite uptick in speed.

Then I decided to try a 2200KV motor. Problem was, the new motor and prop pulled more than the 18 amp ESC could handle, so I swapped it for a 30 A E-flite switch-mode ESC (which also let me remove the Dimension UBEC and let the E-flite ESC provide radio power).

Back to our grass strip! Since the only folks there were Micki and I, I had to toss and fly the plane. You see, Micki refuses to fly a test flight, lest she wreck a plane and hurt my feelings. As to throwing the plane, well, Micki throws like a girl (surprise!), plus she's a good foot shorter than I and the plane starts a foot lower when she launches.

I trotted a bit and THREW the plane forwards and a bit upwards (I may be tall, but I'm not THAT tall!), hitting the power as soon as I could grab the transmitter. YIPES! What a difference the new motor and prop made. Belle screamed off and a little up produced a skyrocket climb.



**BELL XP-59**

After I gathered my wits about me, I put Belle through her paces. Everything was the same as her last legless flight, except it happened at significantly higher speed (yippee!) but with a significantly higher noise level (boo!).

**Conclusions**

I'm hooked – a scaled-up Belle for a Power 25 is underway on my computer!

How about you, readers? Besides Belle, lots of odd planes were designed but never built. The Curtis XP-71, Bristol S24/37, weird Martin-Baker 24.3.43 tank-buster, and that massive Vickers Scheme C (six-engine, canard heavy bomber) are just a tiny taste of the 'could have been' designs that we can make become reality – in miniature, at least!

**RCMW**



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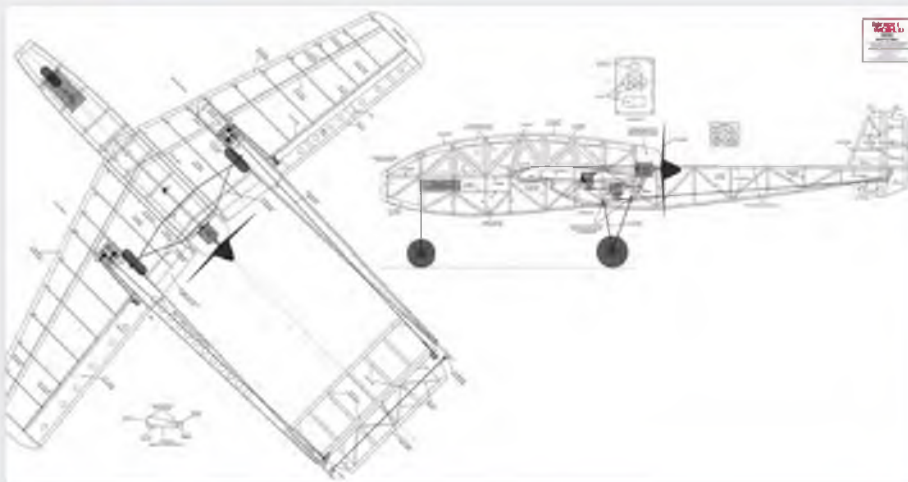
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# Zortayak-55

A 47 inch (1194 mm) span 3-D EPP 'shockie' for 200 watt brushless motors and 4-function R/C, designed by Mike White



## MODEL WORLD

### At A Glance

<b>MODEL TYPE:</b>	Profile sports 3-D
<b>MATERIALS:</b>	15 mm EPP foam
<b>RADIO:</b>	4-function
<b>WINGSPAN:</b>	47 in/1194 mm
<b>MOTOR USED:</b>	DYS A2836/7, 1120 KV (200 W) brushless outrunner
<b>ESC:</b>	30 amp SBEC
<b>PROP:</b>	11" x 5.5" slow-fly prop
<b>BATTERY:</b>	2S or 3S 2200 mAh LiPo



The author shows his model for scale

### Design Considerations

I have built several foamy type shockies. But they have one thing in common and that is that they can only be flown indoors or in totally calm weather outside. I thought that it would be better to have a model that's a bit bigger and heavier so that it could be flown in the windier conditions we now seem to get when it is flying time.

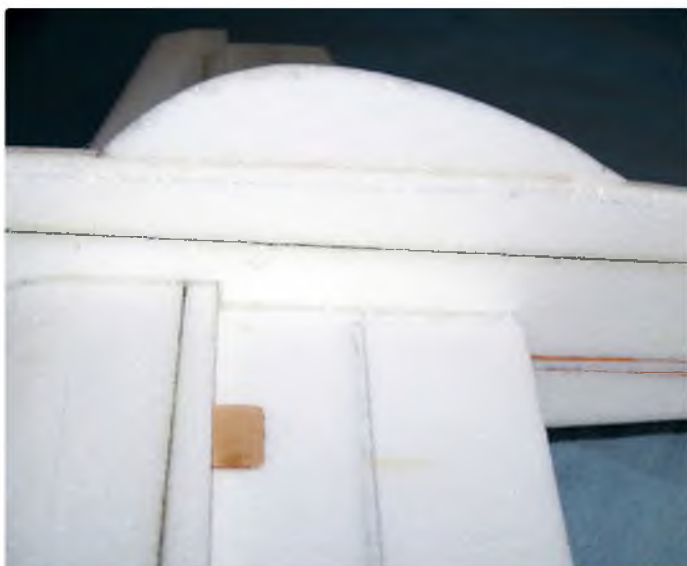
I stayed at the R/C Hotel in Corfu a couple of years ago and watched some flyers doing great things with a 40 inch model built from EPP foam. Now, I know that it is not the plane that makes an impressive pilot but it does help you go a long way towards being one if you practice often and hard enough.

This 'Zortayak-55' model (named so because it represents a Yak-55) uses 15 mm EPP foam with some 2 mm carbon fibre rods as reinforcing where required (see Contacts). The wing is a flat type with a doubler on the top surface at the leading edge, to make a Kline/Fogleman (stepped) type aerofoil (see the KfM2 illustration on the plan) The fuselage is two laminations of 15 mm EPP stiffened with a carbon fibre rod either side. The glue I used to bind the fuselage sides and wing doublers is Stikatak Superspray. But if you use another contact glue be sure that it does not eat the EPP!

For the motor I used a DYS A2836/7, 1120 KV from Robotbirds and fitted an 11" x 5.5" slow-fly prop running from a 2S-3S 2200 mAh LiPo battery and a 30 amp ESC.

It is advisable to use mini metal geared servos, TowerPro SG 90MG for instance from BRC Hobbies, as these will stand more abuse than standard mini items with plastic gear trains. I say this as, if you want





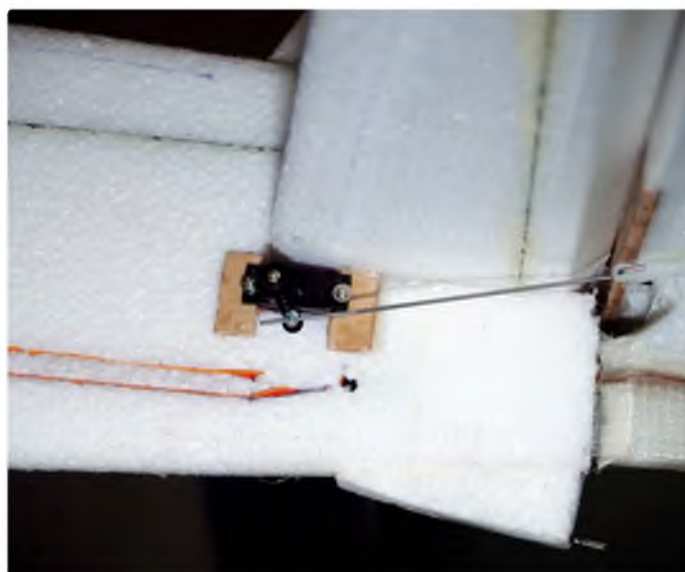
Stepped Kline/Fogleman wing with 2 mm carbon spar inserts



An inexpensive A2836/7 1120 KV (200 W) brushless motor was used to turn the 11" x 5.5" slow-fly prop



Rudder servo installation



Elevator servo installation

to progress in 3D flying (and I hasten to add that I am far from being any kind of expert at this game, but I do try!) you will have to push each flight a little further than the last, and this will bring you closer to the ground and much lower than the one mistake high at which most of us fly! The airframe will stand a lot of abuse and any breakages are easily fixed at the field with five minute epoxy or a battery operated hot glue gun.

### Construction

Getting the outlines onto EPP is a little different from that of other materials and my method is to cut out a shape for the fuselage from stiff card (decorator's lining paper is ideal and cheap) and fix this to the EPP with tape. Mark around the outline and without moving the template make pinpricks through it at the wing, tailplane and servo positions. Now, with a thin tip felt marker pen, push through the pinholes, so leaving small dots on the EPP.

Cutting the material requires a very sharp knife (or scalpel) held with the blade almost flat on the EPP and making several light cutting strokes until you have cut right through. Do not hold the blade upright and, whatever you do, do not try to rush the

operation or the foam will ball up and the cut will be anything but what you want!

To cut EPP foam you can also use a hot-wire cutter (if you have one) in a well ventilated area.

Cut only one fuselage outline at this time, complete with the wing, tailplane and slots cut out. The wing outline could be done in the same manner as the fuselage but, as the angles are fairly straightforward, it is simpler to draw them straight onto the EPP.

Mark out the other fuselage side on the EPP, about one inch oversize all round and cut out. Spray on some Stikatak Superspray, bring the two parts together and press firmly to ensure a full contact. Cut away the slots for the wing, tailplane and servos. The motor mount is now epoxied in place and a line drawn on each fuselage side, from the mount to the tailplane, into which the 2 mm carbon fibre rods will later be epoxied.

Using a steel straight-edge cut slots just deep enough to just bury the rods. After the wing and tailplane are glued in coat the rod with 15 or 20 minute epoxy (ten minute stuff may go off before you have the rod completely in place) and lay it in one of the slots. Using a small screwdriver gently push the rod home along its full length and then

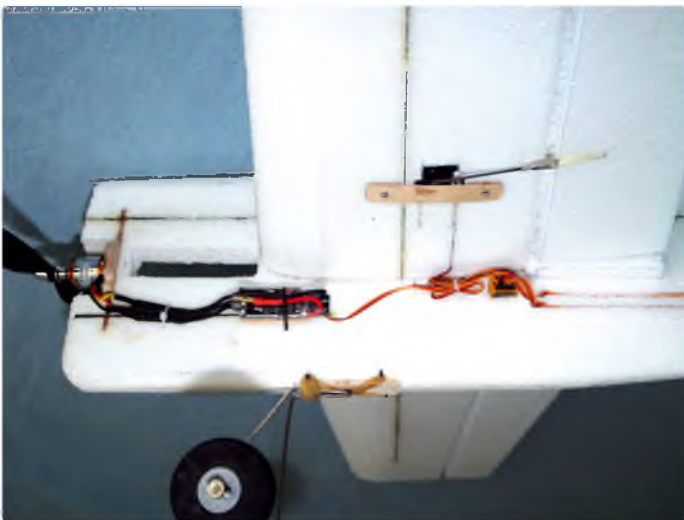
wipe and push the excess epoxy into the slot. This can be a messy job but I cannot find a clean way of doing it. Do the same for the other rod and cover both with a strip of masking tape, ensuring that the fuselage is kept straight. The rods at the lower nose position are similarly installed. An alternative method is to use a hot glue gun set to low.

The elevator and rudder servos are screw mounted onto 1/16" ply bearers, well glued with epoxy. The wires will have to be extended to reach the receiver, which is mounted in a slot under the wing at a convenient place to accommodate the wires. These are pushed into slots cut in the fuselage sides that are just deep enough to hide them and both elevator and rudder wires run down the same side. The ESC and battery are secured with 1/8" nylon ties.

You will see that on some of the model images the battery is pushed into a slot in the fuselage side. Unfortunately this causes a weak spot in the motor mount area in the event of a crash and so this change is necessary.

Cut out the two bottom wing panels first, not forgetting the slots for the servos, and join with epoxy. Now cut out the top doublers. Apply the Stikatak to the wing and doublers,





Aileron servo position and electrics. Note the 'banded on' undercarriage!



The battery fits neatly in the slotted fuselage recess



Fully assembled and awaiting her final colour scheme

covering the area not needing glue with paper, and bring together whilst laying the main panel on a flat surface. Be very careful not to build in a twist or curve by fitting the doubler flat onto the other panel.

Shaping EPP is rather difficult but can be done quite successfully with 80 grade sandpaper glued to a sanding block of approximately 11 inches by three inches. The important thing here is that each end and sides of the sanding block should be rounded to prevent the sandpaper digging into the foam.

To shape the leading edges mark up as indicated on the plan and carve to a rough shape by making cuts using a long, very sharp blade. Shape the LE with the sanding block using light strokes. If you go too heavy the EPP will ball up and you will remove very large, unsightly chunks.

Remove the ailerons and hinge using 50 mm wide nylon reinforced tape. All the control surfaces are done in the same manner.

There are two slots cut into the fuselage; one towards the rear of the wing and another in front of the tailplane, which may be lifted and re-glued as these two units are installed.

DO NOT fit the aileron servos until the wing has been glued into the fuselage as they may not pass through the slot.

I used a hot glue gun when gluing the wing in position by jamming the wing in place temporarily, trammelling to get everything square and then running a good bead of glue all around the wing/fuselage joins.

Aileron servos may be mounted flat on the wing underside in holes just deep enough to accommodate them. They are held in place by 1/16" ply strips screwed into ply plates glued into the wing.

The tailplane, elevators and rudder are constructed in much the same way and are also glued with hot glue. My glue gun is a dual heat affair, a Stanley 0-GR25, which has the advantage of being able to be set to a low heat that does not melt the foam. If your gun is not adjustable be careful that you do not keep the nozzle in contact with the foam for too long. Epoxy glue may, of course, be used.

**Finishing**

Colouring and decoration is a problem with EPP due to the rough surface, which has to be accepted, because making clean straight

lines between the colours is impossible. I found that a spray of colour all over is best, with other colours painted on. The only tape that I have found that will stick to this foam is Gaffa Tape from a garage shop, which is what I used for the decoration on the bottom of the wing and tailplane. Use a light coat of Stikatak spray on the surface of EPP to aid tape adhesion.

When painting be sure that the paint does not attack the EPP. Here I used a spray can of acrylic paint from a garage shop on the top wing surfaces and fuselage.

I do not use any fancy transmitter programming on my model but somebody out there might like to try it to suit their style of flying.

**Flying Tips**

Flyers who are '3D capable' will know where to balance the model. But for those who just want a good fun plane it should balance within the marks shown, and some exponential should be dialled in to soften the responses about the centres. I have 60% on all controls on low and 80% on high rates, which may be considered extreme by some, so select whatever values suit you. One should not be too cautious when experimenting with balance positions – just don't fly too low to start with!

With the motors mentioned the model hovers at about half throttle, which is about where I fly most of the time, except when going vertical. With the balance on the aft point it handles much the same way whether inverted or upright.

One of my favourite moves is to get up high at full throttle and put all the sticks forward and in either opposite corners or together and hold as long as I dare, then reduce the throttle and pull out. Scary!

**Conclusions**

If you have any good or bad comments to make, or suggestions for improvements, to the Zortayak-55, I may be contacted by phone any time before 9 pm (GMT) or by email (see Contacts).

Should you have a nice image of your model of 1MB or more a copy will be most appreciated to add to my collection and may even be used in R/C Model World to show others.

**RCMW**





Zortayak-35 is smooth to fly



Big loops are easy courtesy of the powerful motor and prop



Inverted flight is no problem for this lightweight model



Zortayak is easy to land too!



High-Alpha manoeuvres are easily achievable – with practice!

### MATERIAL SOURCES

**EPP FOAM, CARBON RODS,  
STIKATAK SUPERSPRAY**  
shop.flying-dog.co.uk

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### CONTACTS

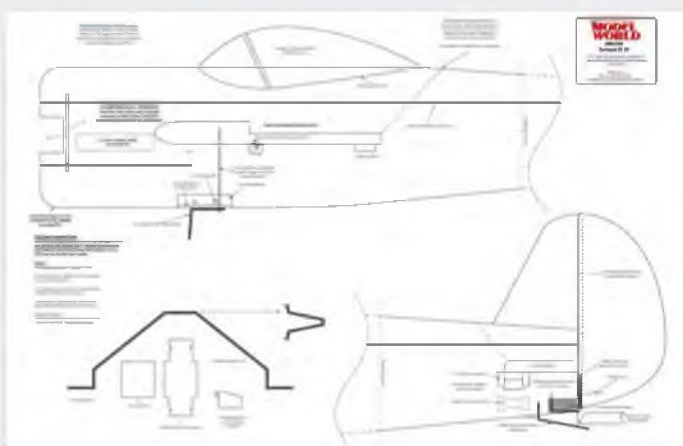
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# Sunset Tiger Moth

Jon Hancock describes his model of de Havilland's much loved biplane, which is the subject of this excellent photograph by Ted Kinsman





The 1/3rd scale Tiger Moth kit was acquired from Toni Clark – Practical Scale, Germany, in the early 1990s and has been flying since then. The aircraft replicates the full size that is kept at Rand Airport, Johannesburg, and which was refurbished by the Stricher Brothers. At the time of taking all of the photographs, I was lucky to have a flip in the aircraft!

The engine is a King 70 cc, spark ignition, turning a 24 x 12 propeller. This combination allows a rich, mid-range throttle setting for

level flight, causing the engine to 'pop and bang' like the real thing. Full throttle is only needed for loops and stall turns. All of the control equipment is Futaba.

The finished surface is Solartex and 2K automotive paint; detailing to replicate its full size heritage.

Flying the aircraft makes me look good as it presents, in all aspects of flight, equal to, or better than the real thing. Irrespective of how slow you fly the aircraft it will simply not stall. Nonetheless, to get the best out of the Tiger

Moth you have to fly it all of the time.

The attached photograph is typical of a winter's evening on the South African Highveld – absolutely breathless and lots of lift from the warmth of the day.

When the aircraft was built and flown for the first time, more than twenty years ago, as it happens by Chris Freeman, little did I know of the pleasure that this aircraft would give me for so many years.

**RCMW**





# Traxxas Aton

R/C car titans Traxxas have entered the world of drones. We get some airtime with their latest creation, the Aton – no ramps required!

There's one thing both racing drones and cars have in common – speed. It's no surprise then that 'the fastest name in remote control', Traxxas, have decided to have a crack at making quadcopters. However, the Aton isn't just a speed-merchant; it's a great all-rounder. That's not to say that it's a 'jack of all trades, master of none' type scenario; a lot of time has obviously been spent making each mode do exactly what it's supposed to, and well.

## What's In The Box?

The Aton comes in a flip-top box, as per usual with most ready to fly drones. The colours and images show off the model both with and without skids and the camera mount, all of which are included in the box.

Inside you'll find everything you need to get up and running. Aside from the quadcopter itself there is a 2.4 GHz 'game controller' style transmitter, one 3000 mAh 3-cell LiPo iD battery and a 3 amp charger with an AC power cord. As well as this, you get two landing legs (and the screws to install them), a vibration damped camera mount, alternative transmitter sticks and the usual spare blades, manuals and AAA batteries.



Everything you'll need to get flying comes in the box





**Transmitter**

The supplied transmitter is a 'controller' style handset but there are optional sticks in the box. While it would be great to have a 'proper' transmitter with a bit of weight to it, the Aton is by no means harder to fly if you're used to using only your thumbs.

There are two shoulder buttons for extra controls, such as flipping in sport mode, and the sticks themselves click in, which is the method for changing flight modes when on the ground.

**Film Mode**

Film mode is the initial mode that the Aton will start up in. It's fairly docile, with the intention being that it can be used for aerial photography with a GoPro or similar in the camera mount.

In film mode the model will automatically take-off then sit in a hover. Due to the 'ground effect' taking-off is something that

novice pilots do sometimes struggle with and so this is quite a good idea for those just starting out. It also means that those only interested in using the Aton as a pure photography model will have less to do to get it in the air.

While Film mode is of course aimed at photographers there's nothing to stop beginner pilots from using it to hone their flying skills. The Aton is extremely stable in this mode and has just the right amount of responsiveness for practising flying figure-of-eights and hovering.

**Sport Mode**

The majority of people flying the Aton will do so in Sport mode. In this mode, the model is much more sensitive to inputs. Again, as with Film mode, the team at Traxxas seem to have really invested a lot of time tweaking and tuning Sport mode to provide a very enjoyable flying experience.

In Sport mode you have the ability to perform automatic flips via a button press, followed by a directional input. The model keeps its height and orientation superbly well when doing this. Something that's really fun to try is to take the Aton to the edge of the patch, fly past yourself with a decent amount of throttle and then throw in a forward flip or two.

Another thing that I personally enjoy about the Aton is the noise it makes when banking and turning. A lot of sport drones are quite 'whiney' but this model almost roars around the field.

**3D Expert Mode**

Expert mode takes all the training wheels away from you and turns the Aton into a fully acrobatic machine! The performance of the model is increased dramatically and the controls are fully manual so you are not just limited to four directions of flipping.



The legs on the Aton are quite long, meaning there's plenty of ground clearance when a camera is mounted



A fully enclosed battery compartment gives you piece of mind



Aton boasts high-power brushless motors



The camera mount clips into the plastic tabs on the underside of the model



It's worth noting that you should be very confident in both your own flying skills and with this model before turning on expert mode. Taking-off requires extra care and attention as it's very easy to put too much correction in.

Once the model is away from the ground in this mode it becomes a pleasure to fly. Even though it's fully aerobatic, every manoeuvre still feels smooth and tuned.

### Return To Home

The Aton features a Return To Home function, which at first glance doesn't seem too special as a lot of drones now boast this option. What sets this model apart is that it has different sounding beeps to signal what the model is doing, which means that if you get completely disorientated and hit the return to home button, you know that it's coming towards you and then that it's descending.

### Air Brakes

Another great safety feature in both the Sport and Expert modes are the air brakes that allow you to quickly stabilise the model in any situation. This is great for those times when you're flying in low light conditions and temporarily lose the orientation of the model. Thankfully, due to the canopy's spoiler (the Aton is designed really well, which is a given with Traxxas), this isn't too much of an issue as there is a very obvious 'front' to the model.

### Dual Mode GPS

The Aton uses a dual-mode GPS. This

enables the model to use multiple GPS features such as geo-fencing, flight ceilings and position hold, making it a perfect choice for amateur aerial photography.

### Flight Link App

Once you've downloaded the Traxxas 'Flight Link' app from the App Store or Play Store (for iOS and Android devices respectively) you can access a huge amount of information as well as tweak your settings.

The ability to check your battery levels and verify GPS and radio connections is a great feature, as you can check exactly what the Aton is doing, ultimately resulting in safer flying and taking away the worry of whether you have enough charge left.

As well as this, there's a whole host of settings that can easily and quickly be changed from the app such as the speed of the model in film mode, adjusting the rates for sport and expert modes, setting geofence boundaries and flight ceiling as well as transmitter settings and even the ability to toggle the LED's on the model.

A lot of drones come with 'companion apps', but Flight Link is much more than that. You can tune practically every aspect so that the model is set up exactly to your liking; you don't need to compromise. What's more, Flight Link is so easy and intuitive to set up and use – something that can't be said for some other manufacturer specific apps.

The Flight Link app will also make sure that you are always up to date with the latest firmware by alerting you when an update is required. This is done using by downloading

the latest version to a Micro SD card (which can also be used to record flight data).

### Upgrades And Accessories

While the version we received was the standard Aton, there is also another version available called the Aton+, which features a gimble camera mount and a heftier 5000 mAh battery.

You can also buy optional accessories for the Aton from the Traxxas Custom Shop such as different coloured LED lenses, canopies and spoilers for ultimate customisation.

### Final Thoughts

If you're in the market for a line of sight quadcopter that does it all, look no further than the Traxxas Aton. If you're a budding aerial photographer and own an action camera you can take great, stable shots. If you're a beginner, you can start off slow and progress right up to full aerobatics without changing models. And if you are a confident pilot looking to get into quadcopters the Sport and Expert modes are just right. As previously mentioned, the Aton just feels 'tuned'.

My one and only criticism of this model is the transmitter or 'controller'. The only piece of the puzzle that's missing to really make the Aton the perfect all round line of sight machine is a 'proper' transmitter. While it is perfectly flyable using the supplied handset, I would love to be able to fly it with a traditional transmitter and really get the fine control that comes with flying with the sticks between my index finger and thumb. **RCMW**



More 'traditional' style sticks can be swapped with these 'controller' ones



The battery and charger feature an integral balance lead so it's impossible to connect them together incorrectly



Aton is super smooth during normal flight





LED strips help to see the model in low light conditions



Expert mode allows you to flip manually



Aton's canopy has some great lines



Flips are great fun with the Aton



The rear LED's give you instant visual feedback



The propellers make a great sound

## MODEL WORLD

### MODEL INFORMATION

<b>NAME:</b>	Aton
<b>MANUFACTURER:</b>	Traxxas
<b>DISTRIBUTOR:</b>	Logic RC
<b>WEBSITE:</b>	logicrc.com traxxas.com
<b>PRICE:</b>	£399.99 (£499.99 for Aton +)
<b>MODEL TYPE:</b>	Sport quadcopter with optional photography
<b>PARTS SUPPLIED:</b>	Ready To Fly quadrotor helicopter, 2.4 GHz radio system, 3000 mAh 3-cell LiPo iD battery, 3 A LiPo battery charger and AC power cord, 4 Traxxas AAA alkaline batteries, landing legs with hardware, vibration damped camera mounting bracket, 2 mm hex wrench, spare rotor blade set, spare hardware, transmitter sticks
<b>PARTS REQUIRED:</b>	None



### PRODUCT SPECIFICATIONS

<b>WIDTH:</b>	472 mm
<b>HEIGHT:</b>	94 mm
<b>HEIGHT WITH LANDING GEAR:</b>	218 mm
<b>WEIGHT (WITH BATTERY):</b>	860 g
<b>FLIGHT SYSTEM:</b>	Auto-levelling 6-Axis
<b>RADIO SYSTEM:</b>	2.4 GHz 6-channel multi-mode
<b>MAIN FRAME STRUCTURE/MATERIAL:</b>	Moulded Composite
<b>BATTERY TYPE:</b>	3-cell Lithium Polymer (LiPo)
<b>BATTERY VOLTAGE:</b>	11.1 V
<b>BATTERY DISCHARGE RATING:</b>	20 C
<b>AC BATTERY CHARGER RATE:</b>	3.0 A
<b>MOTOR TYPE:</b>	Sensorless Brushless Outrunner



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[www.longmarstonmodelairshow.co.uk](http://www.longmarstonmodelairshow.co.uk) or John on 07867785304

All events and acts are subject to aircraft availability and weather all details correct going to print.



# Blighty Blundering

Expat, Dave Goodenough goes walkabout back in the UK



Just inside the portals at IWM Duxford sits a lonely Eurofighter 'Typhoon'. I believe it's an early test aircraft



It could only be a Lancaster! With bomb load pulled alongside, it waits for the call to action



In conserved 'just dragged out of service' condition, the EE Lightning looks every bit the supersonic aerial thug it was designed to be



The Aircspeed Envoy was a very capable plane 'in the day'. Most though remember the similar Anson



What can you say? It's a Vulcan – iconic and recognisable by everyone everywhere. The 'Tin Triangle' is every bit the bomber beast

I suppose we've all been seduced at some time... The promise of someone and something different to play out your passions with, or indulge in a whim that seemed impossible to your ageing self. I was put in such a position recently, following the demands of my wife Pat, the relative cheapness of Channel crossings in October, and the overtures of one Ken Sheppard, retired editor of A.N.Other magazine. Email messages were banded about, promises made and the caravan loaded for a trip back to Blighty. Us expats were going '... out among the English' (a film quote). But before we began our wend northwards, there was one more flying Sunday available before we left home for Caen-Ouistreham and the wide wet 'La Manche'.

## Oh, Nuts!

No, not the late autumnal search for Christmas provender; it was my expostulation at the piste. Keen to get some last-minute practice in with the model I was taking with me to England, I charged the LiPos ready for some Hyper Bipe action.

I've tested the Hyper Bipe beyond its normal limits. All last year I'd been flying said bolide and found that whatever I asked of it, and however outrageously I thrashed the sticks around on high rates, the Bipe simply responded and did aerial things I thought impossible with my limited skills. Staying at least two mistakes high the model was pushed harder and harder into 'you've gotta be joking' manoeuvres. A couple of difficult arrivals had rearranged the looks of the plane

slightly but the tortured foam continued to maintain the sporty looks of this very capable model.

And then there was the Sunday before departure... The 'Meteo' was rubbish, with 20 to 25 kph winds dead across the runway. Thank goodness I had the Painted Pilatus ready too, but I really needed to work out my frustrations on the Hyper Bipe.

With the battery in and flying surfaces wiggled, crosswind taxiing was impossible as the model simply 'weather-cocked' at each attempt. A stroll to the pilots' position, plonk the model down and open the tap... As always the Bipe rocketed away under low rates, gained height fast, then the rates switch was clicked off.

Several minutes of aerial mayhem followed,





The DH9 was part of the museum's 'show and tell' effort, complete with pilot in period uniform. The kids loved it!



Sadly tucked in a corner, one of the most beautiful large aircraft designed – the HP Victor. As yet unprepared, it awaits attention



'A Paddy Bird from Ceylon' it says on the side. The RE8 hangs aloft imperiously over its younger aviation brethren



A DH Mosquito in the strangest garb! Post-conflict this fast and oh-so capable plane was pressed into mundane duties. This one was a lowly target tug



'Sally B', the collection's B17. On t'other side of the nose she is 'Memphis Belle', to celebrate her film role



The big Cat gets a wash and brush-up. Catalina 'Miss Pick Up' primped, polished and put on show

all at full power because of the wind, before the wings started flexing rather more than usual; in fact there was a ridiculous amount of curvature in some stunts. Maybe it's time to... Too late!

I'd never seen a 'foamie' break up in the air before and being the one on the sticks I felt the total helplessness of trying to control a fuselage and tail feathers whilst all four wings were fluttering helplessly like a stricken Daddy Long-Legs, being only tethered by servo leads and the remnants of wing reinforcements. A dive into the runway completed my shame, bringing the short career of this super foamie to a spectacular and disastrous end. I already miss it and will probably (gasp of inward drawn breath here) buy a replacement one.

**Wingless To England**

Despondent at the loss of the only model I could have fitted into our heavily packed car,

Pat and I, model-less and almost silent with embarrassment and annoyance, eventually made it across the Channel and to our first overnight stop close to Westerham, and a certain well-known airfield.

Biggin Hill features large in WW2 aviation history and I wanted to sniff around the place. Unfortunately the Gods of weather had other ideas and we were 'socked-in' by dreadful mist and rain. So we carried on towards Cambridge, literally under Gatwick's flight path, and also 'under a cloud'.

Surprising number one Son with an unannounced visit was one thing, but hearing him chat with his Mum and mention that a visit to Duxford was a 'must do' was a complete surprise to me. Nay, a shock indeed!

To those few of you out there that don't know about Duxford, it's been an airfield since Pontius was a Pilot and needed a rigger for his Sopwith Camel. Not only that

but it houses a huge number of aircraft – and more – as part of the Imperial War Museum. It is without doubt the most impressive air museum in England and stands as one of the very best in Europe.

Despite living just a ten minute drive from there for over thirty years, I'd never visited the museum before moving to France. In fact the last time I'd been there I had watched Alf Hagon on his J.A.P. powered bike, motorcycle sprint racing on the main runway; all you old bikers out there will know the name and game.

Our family group foregathered at the entrance, shuffled through the ticketing hall, emptying our pockets as we went, and bore left towards the AirSpace hangar at the Eastern end of the museum complex. Full of anticipation, wife Pat and I passed through the portals...





Cierva autogyros were a branch of aviation explored mostly in the 1930s. Still a minority niche type, modern ones are still being built



Another plane with the well-earned label of 'Icon' – the SR71 'spy' plane. Fantastically fast, it leaked fuel like a sieve until at service temperature!



How can you not like the quirkiness of the Shuttleworth Collection's Aerona C3? With that 'bum near the ground' stance it looks almost model-like



If ever an aircraft shrieks 'thoroughbred' it's the Percival Mew Gull. It looks fast just sitting there, waiting for the call to return to its element



A French Fauvel A.V.36 'Monobloc' flying wing aviette nestles amongst the serried ranks of Les Avions Anglais



The Hawker Cygnet still has the 'look' of a proper aircraft, despite the stringent design rules applied in the 1920s Lympne Trials

**Stunned And Speechless**

It's a new experience for me, being unable to link eye, brain and mouth, then make utterance in the form of an understandable sentence. Wow – what a place! We could see the main hall and all its aviation gems before us, but just inside the entrance and to the right was a large dimmed area with what I consider to be one of the most beautiful large aircraft ever designed and flown – the Victor bomber.

Its raison d'etre may originally have been nuclear destruction, but what a magnificent aircraft. The heavy lift ability and innate strength enabled it to serve longer than the two other 'V' bombers, enabling the planes to become a vital tanker force until relatively recently. In fact I'd worked on constructing and installing ground support equipment for its replacement Lockheed TriStar tanker/transports, back in the 80s, when working at Cambridge Airport. The example resting

here remained in well-worn 'as delivered' condition, stuck in the corner of this preparation area and looking forlorn. I must build a model of it one day...

Entering the main hall will amaze any aviation nut, but where do you start?

The obvious 'biggies' demand attention – an Avro Lancaster sits in night bomber colours, close to a virtually all-white Short Sunderland flying boat – the feared WW2 'Flying Porcupine'. The nose of the original test version of Concorde towers over the Lancaster's tail, whilst TSR2 – the most capable aircraft design of its time, until squandered by squabbling politicians – vies with floor space near the Avro Vulcan and English Electric Lightning.

Overhead hang an Airspeed Oxford and a night camouflaged Lysander, its awkward and clumsy looks belying the fact that this was a thoroughly capable machine used in so many espionage operations.

Another favourite that I saw active on some of its last ops at RAF Wyton is the English Electric Canberra. I believe it was the last operational RAF aircraft to have a wooden flying surface – its fin; an old aviation 'chippie' workmate used to work on them.

Earlier birds are not ignored. A DH 9 sits in all its glory, part of a show and tell 'meet the combatants' special, whilst 'A Paddy Bird From Ceylon' – an RE8 I believe – hangs on high near the ubiquitous Tiger Moth, proudly hanging over the aircraft that it helped to train pilots for.

Also hanging on high is 'The Wooden Wonder', a DH Mosquito, in the strangest colour scheme; silver top surface and yellow/black broad diagonal stripe under-surface. If I remember right, this is the post-war 'target tug' colour scheme.

I blundered about the hangar, snapping photos whilst slack-jawed with awe, before the others collared me and dragged my





Ancient wings dominate this corner of the hangar and there sits my favourite, the English Electric Wren, with the A.N.E.C. alongside. All competitors in the 1920's Lympne Trials, the Wren won in 1923. As my mate Yann would say, "...eet's so strange, eet must be English!" Strange or not, I think it's a curious beauty and I am building one right now

How tiny is that! The miniscule 3 HP A.B.C. engine that, 90+ years on, still gets the Wren aloft – but only just!

whingeing self out to the next indoor selection of gems. I hesitate to head into a list of all the hangars and the wonders therein contained, but suffice to say that – sore of feet and knackered of body – we spent virtually the whole of the museum's opening time (10:00 am 'til 4:00 pm) wandering in wonder.

If you live within a reasonable distance, or are visiting 'The Old Country', you just have to visit this fantastic place!

**A 'Holy' Place?**

Some flying sites in Britain are special and for many of us model manglers Old Warden is very special indeed. For me it is everything that is perfect about early aviation. The Shuttleworth Collection has a jumble of disparate hangars containing some extremely rare original aircraft from the 1920s. There are so many more planes of other periods, but for me it's the aircraft of the Lympne Trials – and similar – that 'light my flame'.

Ken Sheppard had invited us to visit the place, and who was I to say nay! A genteel cuppa and chat preceded our whistle-stop tour of the museum and Ken's own need to take lots of detailed photos of the collection's Aeronca C3, the subject of a future project.

I too needed detailed photos, as I intend to build models of a couple of the inhabitants – the English Electric 'Wren' and DH53 'Humming Bird'. Unfortunately the collection's DH53 stalled/crashed a while ago and as a result the pilot tragically died. Another 'Lympne' aircraft, the Bristol Brownie, may be the subject of my next plan build; unfortunately no example survives, even in this temple of early aviation.

With cameras exercised and sated, Ken invited Pat and I down to the airfield, ostensibly to meet 'some of the lads' – as it turned out, not just to view and natter. They were a bunch of really nice blokes, out for a bit of playtime with their 'boys toys'; no different to any of us other weekend wing wagglers, then?

Handshakes all round, a bit of mickey taking, then "...Dave, can you come to the tower and sign in please?" from Ken. So what's all this about then, I thought? With the official stuff done I found myself air-side of

the barrier, a place I'd been on model flying only days in the past, always in the lee of the spinney and part of the 'Chuck and Duck' free-flight community. 'The Guys' were doing their stuff with varying degrees of control and ability – fun to see and comforting too, as my own abilities are suspect at the best of times!

Ken put up his 'Artizan' electro-foamie – a pretty little sky-dancer of a model – and proceeded to 'wring it out' a bit. Bringing the model back in after a couple of minutes, he then thrust the transmitter into my mitts. Wot, me fly R/C over the hallowed turf of the main runway at Old Warden? I had an epiphany (painful, but not life threatening), realising that my scribbles had convinced him I really could fly. With verbal nudges forthcoming, I shoved the throttle stick forward and mentally hung on to my hat...

**Big Boys**

My immediate reaction was panic. Ken flies this model with lots of control surface movement, something I'm not used to. After the first few 'all over the place' gyrations a few neurons fired and I reduced finger movement. Ken switched in the rates for me and I settled down to have some fun. Apart from being called to fly a 'tighter' circuit, I think I acquitted myself adequately, until someone told me to get it down quick as there was a full size plane that needed the runway.

Despite my mild panic, the model came in and landed gently. I admit freely that my hands were shaking and my knees had the consistency of blancmange, but the day was suddenly brighter and everything seemed sharper somehow – excess adrenaline will do that to you every time!

Ken also had a little EDF foamie jet. Despite a false start due to a reversed in-runner, he eventually stood there in a manly stance with the wee beastie howling in his ear. A good shove saw the model... plummet to the ground and break in half! He took the setback in good humour - what else could he do with all his mates around passing comment and wind in equal measure!

Our day eventually drew to a close and full of food and new memories, we traipsed wearily back to our Cambridge based 'tin tent'.



Ken Sheppard, airside at Old Warden and pondering the coming flight with his 'Artizan'. It all went well

**Quelle Surprise!**

With our stay in the South drawing to a close and SatNav primed, the odyssey continued with a short voyage northwards. The Midland environs were a stop on our way towards son number two and we 'pitched up' in the small, pretty village of Sutton Bonington. So what, I hear you ask?

Well said village lies next to Kegworth, under the approach/take-off path of East Midlands airport. "Was that deliberate?" asked my wife. "No dear", I lied, with angelic innocence plastered on my visage. "Just mere happenstance..."

Plane spotting may be a bit geeky, but stir in live air traffic input on your computer and it gets a whole lot more interesting, especially when your other half is engrossed in her latest Mills and Boon 'Bodice Ripper'...

**RCMW**

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 www.ivm.org.uk  
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## SPECIFICATIONS

### Firmware

- Calibration: automatic bed levelling and machine calibration routine
- Layer resolution: 0.3mm 0.05mm
- Build surface: Removable bed, uncooled Buildtak print surface (For printing with PLA) Heated aluminium plate available as an upgrade, (allows printing with ABS, PETG, PC, HIPS, and many more).
- Print speed: 0.4mm nozzle, up to 16mm3/s
- Motion: Up to 250mm/s, 4000mm/s<sup>2</sup> acceleration, segmentation free real time delta movement
- Nozzle: 0.4mm diameter, maximum operating temperature 300°C, warm up time  $\approx$  60secs.
- Power adapter: 100V/240V, 60W.
- Software: Machine control: On board web interface available via ethernet, USB control, also available
- Standalone printing from onboard microSD card

### Software

- 3D model processing: Slic3r open source software (free download - no license required) can generate G Codes for the Fisher Delta from .stl or .obj 3D model files.
- Supported platforms: Windows/Mac/Linux
- Prints G Code files generated by Slic3r and other open source slicing software

### Materials

- Standard 175mm diameter filament (PLA Plastic)

3D printing is the perfect way to make bespoke scale details for all types of models. The builder of this big 1:3 scale RC model of a Druine D-31 Turbulent aircraft needed to represent the parts of the VW engine that protrude from the side of the cowling. He was able

to supply reference photos and drawings of the full-size engine, so creating a 3D printable model was fairly straightforward. He'll need to do some sanding/filling/finishing before painting and detailing it, but it should look just right when installed in the model.



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# Light Flight

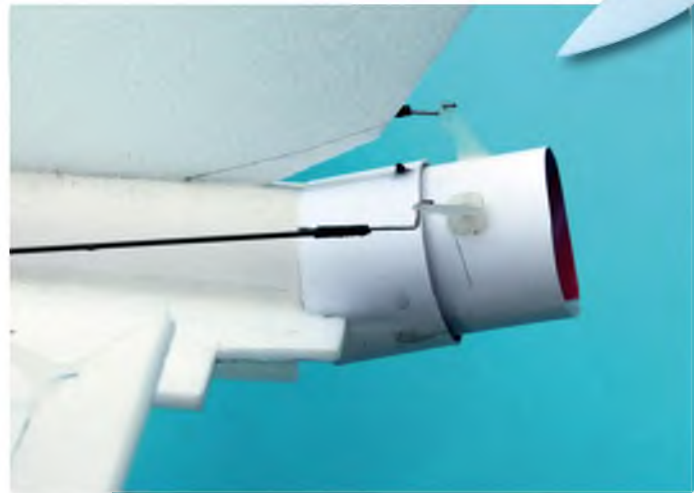
Small model topics discussed this month by John Stennard include a pair of successful maiden flights, problems with micro R/C conversions and kite style indoor models



This Micro Eurofighter incorporates a vectored thrust system



The two section tailpipe nozzle is linked to the elevon servos



The tailpipe nozzle is shown here in the 'up elevator' position

Writing this much earlier in the year, I had just experienced one of those memorable model flying experiences. Well two, to be more accurate. A brilliantly blue sky with no wind, coupled with a temperature just above zero, encouraged me to visit the model field to test two new models. This was going to be a 'one battery' flight for each to check them out. The models had been ready to test for a while but the weather had put a dampener on this idea.

Both models were special in their own way as one was a Micro Eurofighter EDF jet built from a Foam Concept Jets plan ([www.foamconceptjets.com](http://www.foamconceptjets.com)) and the other a Hornet from Flying Wings Ltd ([www.flyingwings.co.uk](http://www.flyingwings.co.uk)).

Now I said they were special as the EDF Eurofighter has vectored thrust (very unusual for a model of this size) and the Hornet is listed as a Mini FPV Racing Wing! Ideally

when test flying it's nice to have a launch person and non-freezing temperatures as frozen fingers do not help with either the piloting or fiddling with settings!

The temperature was tolerable, well for a short time, but as I was alone at the field (no surprise there!) I would have to do my own launching. I do quite a lot of my own launching and this is where I find that a transmitter neck strap or tray is very beneficial.

The Micro Eurofighter was first away and flew beautifully. The vectored thrust provided some interesting flight characteristics, which will be fun exploring in more favourable flying conditions. Safely down, it was the turn of the Hornet. This was just a test flight so although the camera and 5.8 GHz Tx were installed I would not be flying with FPV.

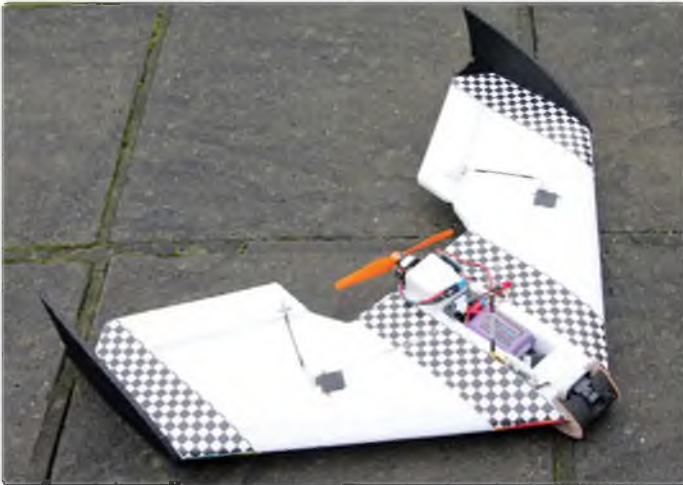
Gripping the fuselage pod from underneath seemed the best way, but a fast revving

pusher motor very close behind your hand is not ideal. I decided that the Frisbee fling type launch was the safest way for the pilot, if not the model. I need not have worried as the Hornet flew away beautifully smoothly and proved to be both extremely stable and easy to fly. A quick check on its aerobatic potential showed rolls, loops and inverted flight could be achieved with ease.

I am really looking forward to flying the Hornet with FPV as my Hawksky FPV 'hack' is a bit aerobatically challenged. To be fair this excellent Dynam motor glider survived all my FPV training and proved ideal in the role. Before the Hawksky I had tried a camera on my Flash but I soon found this was not the best model to learn to fly FPV!

So two models tested and definitely not found wanting. However, sometimes things do not go so well – read on...





The FPV Hornet was my second successful 'test of the day'



My first attempt with FPV used a camera fitted to my Flash profile foam model



My first attempt with FPV used a camera fitted to my Flash profile foam model



Dynam's HawkSky V2 proved to be a great FPV trainer

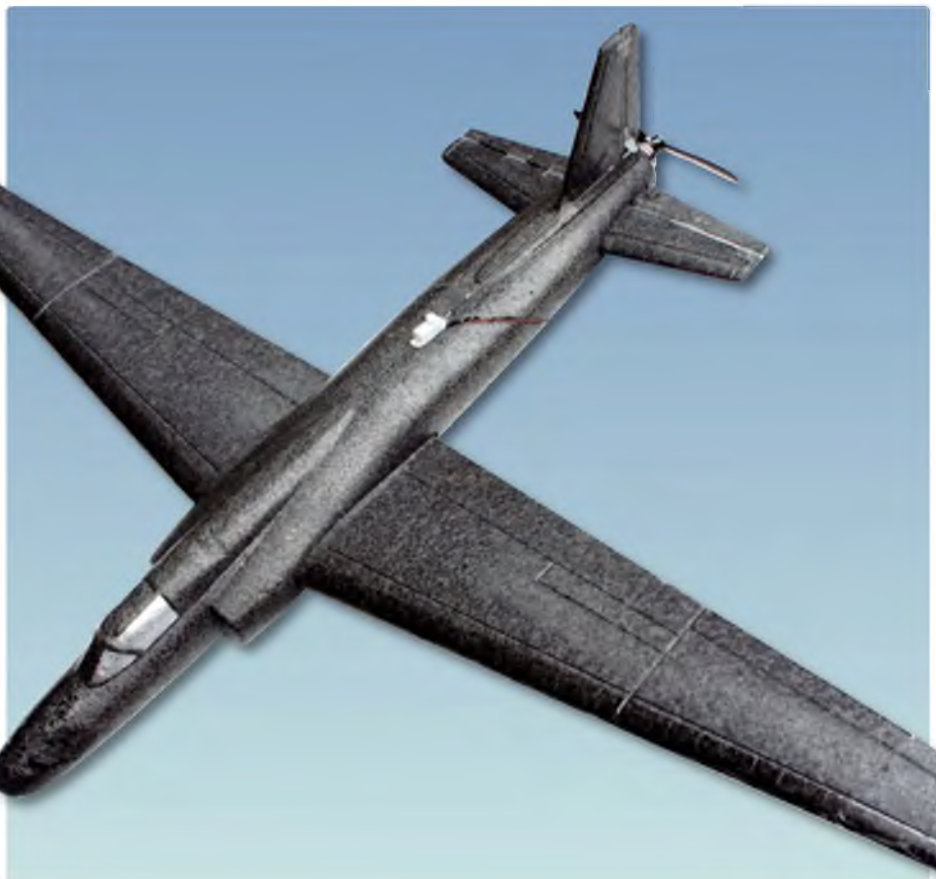
**Problem Planes**

Converting a model to R/C, or just converting a model, can be an interesting experience and usually, but not always, goes well. Two models that were 'model show bargains' have provided me with interesting modification experiences, but sadly rather poor flying experiences.

The first was an Estes U2 chuck glider and this seemed to have lots of potential for R/C conversion. After all the U2 is really a hideously overpowered glider. It's really interesting to read about the landing technique for this aircraft. I saw one fly at Duxford many years ago and it had a very impressive take-off and climb-out.

My modifications for this model were to fit rudder and elevator control, with a pusher brushless motor at the rear. The conversion was actually quite simple to do but I was never able to get the model to fly well. It was very unstable and difficult to control. After numerous C of G experiments, control surface movement adjustments, etc., I abandoned the conversion and passed it on as a chuck glider to a youngster who was very happy to have it in its original form.

Enter the Polikarpov I-15, which was not really a true conversion as it was designed as an R/C model. I was immediately attracted to this Axion RC model as it was a model show bargain. It was small, looked fantastic and had an unbelievably low price. The model included a 1S 300 flight LiPo, but no charger and no Axion Link AX-4CT transmitter.



Estes U2 seemed to be an ideal conversion project



## LIGHT FLIGHT

When unpacked this 500 mm wingspan model was even more delightful than it looked on the box and I examined the R/C installation. Two micro rotary servos were fitted for the rudder and elevator, while the brushed, geared motor used an ESC that was integral with the receiver board. The Rx board was removed and unfortunately the servos did not have suitable connectors for an Orange or Spektrum micro Rx. However, they were of a standard micro size so were easily replaced with alternatives.

The ESC was a different issue as micro brushed ESCs are not that common. But I had a 3 A available to try from another model. I quickly found that the ESC could not handle the full throttle range and consistently cut at just over 50% power. I did try to fly the model at this low 'full power' throttle setting but it was inadequate.

Eventually I found that J Perkins had a 7 A micro brushed ESC available and this immediately solved the cutting out problem. Now, with plenty of power available, I test flew the model again. Unfortunately this proved harder than expected as it was basically uncontrollable. The motor gave loads of power but this short-coupled design required the addition of nose weight to achieve any degree of stability. Even then it was very marginal and wanted to roll and try to destroy itself at every opportunity.

I figured that ailerons might help so I fitted two Spektrum linear servos on the upper wing. This required some fiddly soldering to enable the two servos to operate from one Orange micro 4-ch Rx aileron output. I hoped that the addition of ailerons would cure the roll problems but I was disappointed. The ailerons seemed to be very ineffective and I eventually programmed in CAR (combined aileron and rudder). Initially this seemed promising and went some way to giving more control, but the model was still almost un-flyable.

Eventually I managed to get her to fly in a straight line but as soon as any attempt to turn was introduced this quickly led to a roll in. As you can imagine all these heavy arrivals eventually started to cause more and more damage to the airframe. While the Polikarpov I-15 had not really flown it had provided me with some interesting modelling moments and I had enjoyed all the experimentation. But you can't win them all!



A 5 g pusher brushless motor and 1S 300 LiPo provided the power



The motor, ESC and Rx can be seen in this photo



The larger FMS Alpha Jet conversion flew well with a tractor motor set up



The Orange 4-ch micro Rx and brushed ESC. Note the neat gouge from a hot soldering iron!

What an eye-catching model the Polikarpov I-15 is



The original Rx/ESC module had to be removed



**Wild Ideas Still Airborne**

In the October RCMW, Bruce Corfe featured the Bigdotuncle Kite models based in Singapore. Looking back a bit historically, the first 'Kites' from Bigdotuncle were based on the WildRC IFO. Mk3 and Mini IFO, sold at the time in the UK by Allflight. Originally weighed down with a geared brushed motor and NiCads the IFOs really came into their own when brushless motors and LiPo's arrived. Using these new developments the power weight ratio was vastly improved and we could fly more slowly at high alpha angles and even hover – for a very short time!

However, before this revolution we upgraded our IFOs to fly really well by using a German geared coreless motor with CF

prop and a pack of six Sanyo 120 mAh NiCads. An expensive option as these were all top end items in their day. It was our indoor aerobic model of choice for a long time before Depron and EPP began to take over.

We do still have a couple of airworthy ones in the club but their occasional appearance in the air makes all the 'foamies' immediately dive for cover! I've included a photo of an IFO that still flies regularly when we give it permission!

There are still many foam models around that use the IFO type basic design and shape and perform well. It's interesting to see Bigdotuncle are still using the IFO type construction to produce new versions.

When the IFO disappeared off the UK model market I bought a Kite and was amazed by the ease of assembly. Of course before the IFO arrived the Stubenflieger (Housefly) and Maus (Mouse) from Braun in Germany had already started the CF rod construction trend.

These models, and the IFOs, were masterpieces of CF rod bending, binding and bonding. They took advantage of the special properties of CA glue, and when the CF rod framework was covered the resulting airframe was really tough and durable. However for many good reasons EPP fun models now tend to dominate our indoor skies. Nutballs have seen a revival and are now being used by a number of our indoor novices.



This is an original Wild RC IFO with geared brushed motor and NiCads. Exciting to fly and lots of fun



This is a Mini IFO with a brushless set up. It was a really potent model and not for the faint hearted!



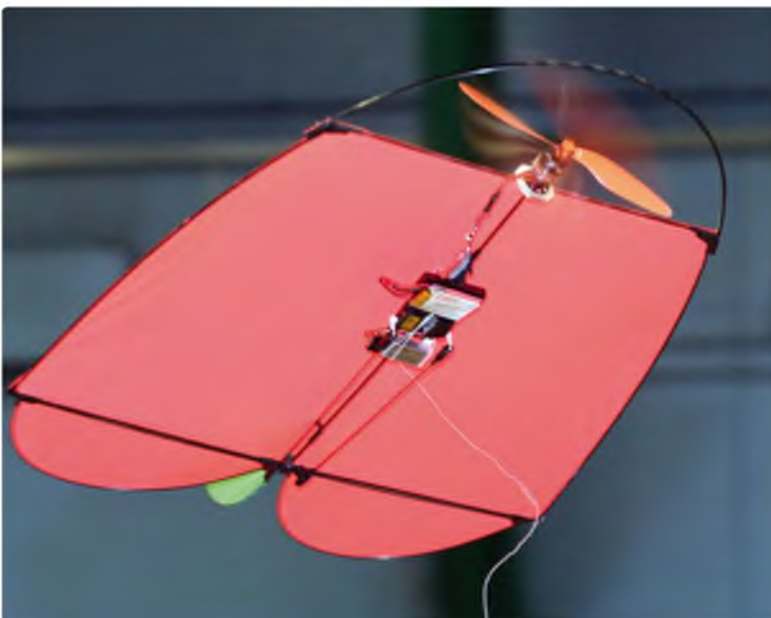
Still flying, this IFO still terrifies the foamies at our indoor sessions!



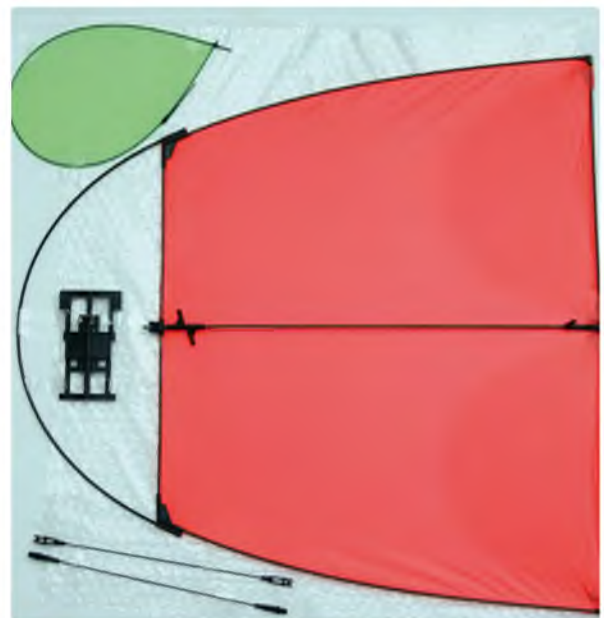
**Left:** All the neat fittings made the Kite very easy to assemble



**Right:** The equipment bay was neat and functional



The Kite performed well and had a lot of potential for outdoor fun use



This is how my Kite arrived. I did not miss the CF rod bending, binding and bonding one bit!

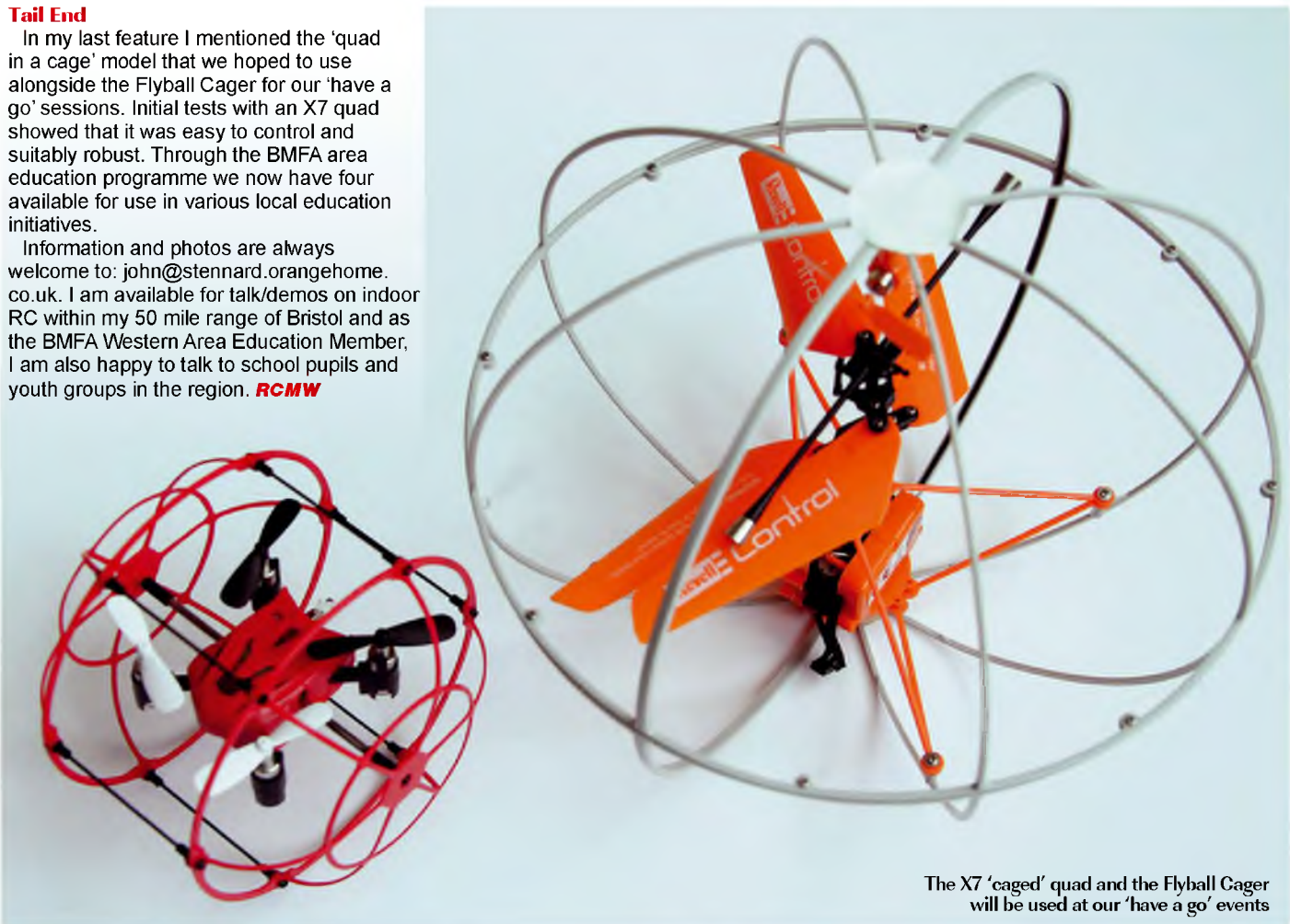


## LIGHT FLIGHT

### Tail End

In my last feature I mentioned the 'quad in a cage' model that we hoped to use alongside the Flyball Cager for our 'have a go' sessions. Initial tests with an X7 quad showed that it was easy to control and suitably robust. Through the BMFA area education programme we now have four available for use in various local education initiatives.

Information and photos are always welcome to: [john@stennard.orangehome.co.uk](mailto:john@stennard.orangehome.co.uk). I am available for talk/demos on indoor RC within my 50 mile range of Bristol and as the BMFA Western Area Education Member, I am also happy to talk to school pupils and youth groups in the region. **RCMW**



The X7 'caged' quad and the Flyball Cager will be used at our 'have a go' events

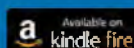
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# Soarers' Slot

Mike Proctor describes how to make a Correx transport box for your gliders

## Beatniks Are Back...

The Beat Generation arrived in the 50s and 60s and it is hardly surprising that Jim Baguley used the popular term of the time – 'Beatnik' – when naming his 66" span, Open power model in 1960.

I met Jim years later when, through his company St Leonard's Models, he produced the Super Nova series of R/C Soarers, which I flew in 8 foot, 10 foot and finally 12 foot span versions.

When released from his position of production assistant on the Correx box project (see Box Populi), Martyn Wharrie was able to return to completing his excellent winter project, electrifying a Beatnik!

A few small things have, of necessity, been done to the original design. The first was to enlarge it to just under 2 metre span, with the intention of giving it a chance in the occasional 2M club comp. The second is not unusual when electrifying free flight models, which weighed very little but had a relatively heavy engine bolted to the front – the nose needed lengthening when using a small outrunner.

In fact the original nose stopped where the pylon meets the fuselage but the lengthened one fits in well and gives the model a more 80s look. The wing section has had the not inconsiderable undercamber reduced, in the hope that the model will have the ability to penetrate upwind, a necessity the original never anticipated!

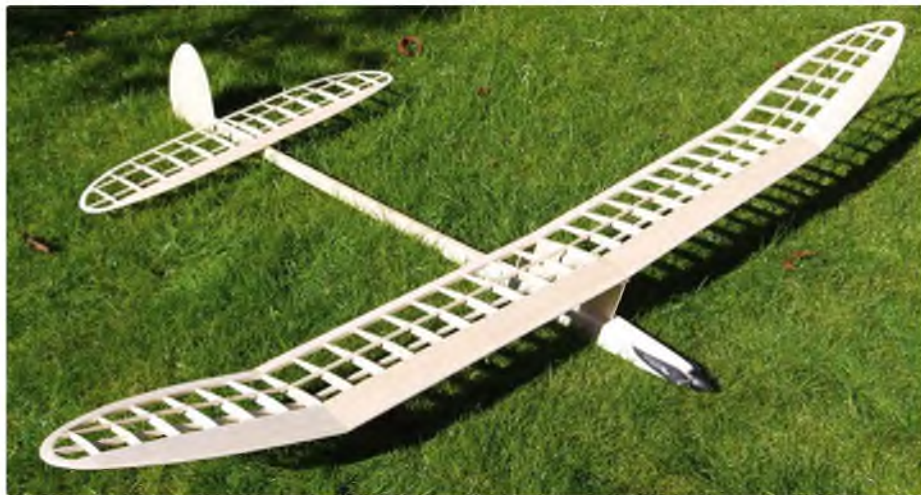
The elliptical tips were common at the time and add a graceful look to the Beatnik. Spars have been changed from balsa to spruce, in the wing and fuselage, but the general 'look' of the construction is as it was when designed.

Covering is under consideration, as it needs to give stiffness, be durable, light and look 'right'. You should be able to find out here what covering has been chosen, once the deed is done, flight tests completed and more pictures taken.

can see here. As you can see from the real Clark Y profile it is somewhat different. It is amazing that a compression top spar was not added originally. However, the fact that this one has survived being flown since 1978 speaks volumes for either the structure, or the pilot – or both!



Goldberg Gentle Lady ribs. Flat bottomed from front to back, such ribs are often called Clark Y and are certainly easier to build. Look at the 1960s spar positioning – see text



Martyn Wharrie stretched the Jim Baguley designed 'Beatnik' Open power model to become just under 2 m for eSoaring fun and competition flying



The nose originally stopped where the pylon starts and a big, relatively heavy engine did the balancing. But now some lengthening is required! Still looks the part though

## Clark What?

Many a model wing I built years ago had a section which was completely flat-bottomed and as such was always described as 'Clark Y'. Sometimes 'slimmed', 'skimmed' or 'thinned', this section was to be found on a considerable number of kit models from various manufacturers and covering rubber, power and glider types.

Its use was very understandable. It was easy to build; you just pinned the leading edge, trailing edge and all the spars to a flat board and planted the ribs on with balsa cement Top spars and maybe leading edge sheeting came next and the whole thing was done quickly and efficiently – if you don't count the time spent removing the balsa cement

from your fingers! It was easy to trim, flew well and displayed few vices that I can remember. So what was the problem?

Nothing really, except that the section so often described as 'Clark Y' was no such thing as a true Clark Y has an upswept nose, giving better penetration and precious little deterioration in glide performance, but was more difficult to build with rudimentary equipment. So, the generic term 'Clark Y' was bestowed upon any flat-bottomed section.

What brought all this on? Well I mentioned Dave Langley's Goldberg Gentle Lady in the last column and he is cracking on with a slightly extended version. The term 'Clark Y' turned up in his description of the section, when he sent me the pictures of the ribs you



A 'proper' Clark 'Y' section. Note the upsweep to the underside near the leading edge



**Box Populi**

At long last the opportunity (should that read 'excuse'?) to visit Portugal cropped up when Manuel Leite de Almeida told me that there would be an F5J International there in spring. Plans were made and logistics considered! The main problem for Martyn Wharrie and I was how to transport the models from Manchester to Lisbon. Clearly, 'in a box' was the answer, but how best to make such a box?

As usual in the design process, research was the key. This sounds very grand but asking somebody who has done it several times before seemed sensible! So most of the following was contrived from Brian Johnson's description of his travelling model box, made entirely from 10 mm Correx, which is a twin-walled polypropylene sheet, much like cardboard in its construction.

We started with a requirement to get up to three models in the box, along with a transmitter, charger and various other bits and bobs. As Correx was available in (nominally) 8 x 4 feet sheets and was to be made by folding it into a rectangular tube, we could play with the height and width dimensions a little. The two main constraints were the longest single component, a wing in this case, and the height of the tallest fin. We set the length at 1990 mm, height 380 mm and width 230 mm. The height and width, when doubled, conveniently add up to 1220 mm, so using the full width of the sheet.

Cutting the full sheet to 1990 mm (from 2440 mm) left us 450 mm, which was plenty for ends and experiments. We cut a 50 mm strip and made a template to check our sizing and its working properties. We learned a lot from this; for instance, these were the only cuts we were going to do with a knife!

Correx grabs the blade and having to cut across the flutes is hard going, as they are spaced the same as the sheet thickness at 10 mm, so there are a lot! We were definitely not going to cut the rebates for the end pieces this way, even with a knife blade set to 9 mm, as pressing through to the bottom skin would be quite possible and the whole process would be very time consuming. This was a job for a router!

A test piece also convinced us that removing a small piece of the inner skin at a flute, to promote the 90 deg bend at the long edges, would be difficult; doing a straightforward bend in the sheet would be better but not without problems.

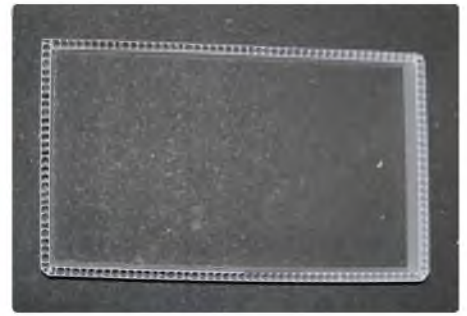
Construction started with the cutting of the rebate round the edge of most of the sheet; none of the panel which would become the box top was touched. This was all done with a router set to 9 mm deep, using a scrap piece of MDF as a guide. This does not need fixing down – just get your assistant to stand on it!

Once this is done any burrs or slight excesses could be easily removed with a Perma Grit tool or a sanding board.

With the three positions for bending marked on the flutes we tried to make the first bend and it became obvious that Correx was considerably stiffer in larger pieces than our 50 mm test piece indicated. Some positive encouragement to start the bending was needed and a slight vee in the inner surface looked favourite. This was achieved with the aid of a wooden chisel, about 50 mm wide and having a blunt, rounded edge and corners. Tapping this along each flute line



Phase 1 in the great Correx box build – checking that the fin on a Pike Perfection will fit into the chosen height (380 mm) before committing to the bending process



A 50 mm slice from the off-cut was used to test for sizing and the best method of bending. Rather than a cut-and-tuck corner (top left) a straightforward bend was used on all the box edges



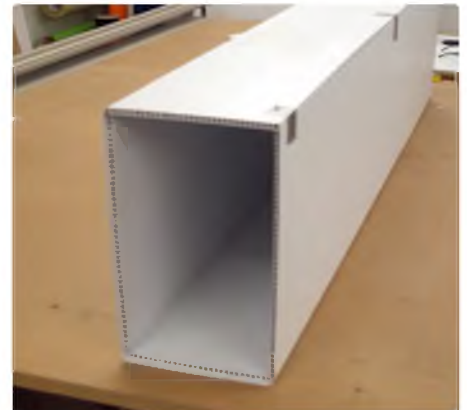
To give some mechanical strength at the ends the sides were rebated to accept them. The long edge where the top rests is also rebated, as is one side of the end panel. A router was used here; a knife would be possible but this was much quicker and more accurate



A Perma Grit tool was used to trim any surplus, or sharpness, from the cut edges



To encourage the sheet to bend along the selected flute it was found useful to create a dent in the inside surface. This blunt ended wooden chisel was created for the purpose and did a fine job



Returned to tube shape and held there with gaffer tape, the box is ready for the ends to be fitted



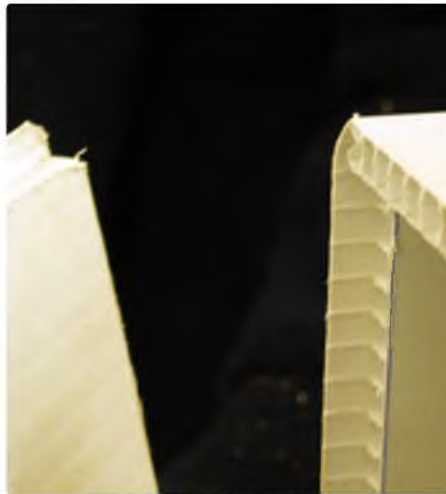
The sheet has been folded here and then left to return to the flat, which it has no hesitation about doing! Sensible people would do this bending somewhere warm, or wait for summer. Neither applied in our case, of course!



worked well and soon we had the three bends done and a Correx tube stood before us. It stayed that way so long as it was taped together because it retains a considerable amount of spring in the joints!

To complete the box all that was needed was to make the two ends, from the off-cuts. One edge needed a rebate, where the top would be located and this was cut first. Then the sides were marked and cut to fit into the 'tube' ends. They were secured there with Gaffer tape; actually we used Gorilla Tape to finish the main build. Luggage straps, with snap-locks, keep things closed and provide handles.

Some facts and figures. Correx is not cheap and being supplied in 8 x 4 sheets it's not easy to transport, other than in a van. As the cost of delivery was almost as much as one sheet (£30), we went for the 'spend £100 and get free delivery' option. Hence we got four sheets and have enough for two spare boxes! Final weight was 5 kg for each box.



The ends and top edge are rebated in, giving considerable strength to the finished box



The only fixing on the whole box is done when the ends are taped in place. We used black Gorilla Tape but if you prefer orange try the Jaffa Tape equivalent!



The finished box with a Maxa and a Pike Perfection inside, leaving plenty of room for more planes and equipment. The 3 x 50 mm wide luggage straps were £6 and provide useful handles, as well as keeping the top shut. For air transport the whole lid will be taped round as well



Steve Haley made these useful hangers, which allow the fuselages to be hung upside down, utilising the available space to the maximum



Slotted across the side flutes, the hangers also afford some more anti-squash resistance



And finally! A general impression of size of the transport boxes, which weigh 5 kg each

**Saw Blades**

I heard that there was a version of the usual scalpel blade available that had saw teeth in place of a knife edge. Thinking such a blade would be useful for various operations, for instance when installing servos within wing skins, or cutting access hatches, I sought them out online. They are distributed by Free Flight Supplies, are called Micro Saw Blades and fit into a No.3 Swann Morton handle. They come in two thicknesses, 0.5 mm and 1.0 mm. I bought a set of each.

As you can see they are cut from one piece of stainless steel and are retained by small tags. I had not realised that they come with different sizes of teeth. The thicker ones – Fine and Coarse; the thinner ones – Fine, Medium and Coarse.

I did have to do a bit of remedial work with a Needle file to get the blade slots to fit into the No.3 Handle, on both the thick and thin

blades. If you are wondering why there are double connecting ends on the .5 mm blades it is because they need doubling up to be a good fit in the 1 mm groove in the handle. I found it easier to put the doubler on first and then slip the saw blade on.

Tested on balsa, thin ply and carbon sheet, the blades cut well and, of course, being small and pointed they go round corners very easily. There is no 'set' on the teeth so the slot (kerf) they leave is just blade size, however they did not seem to stick in the cut. Time will tell how useful they are.

**RCMW**



Micro Saw Blades. Available in 0.5 mm and 1.0 mm thicknesses to fit a Swann Morton No.3 handle – see text for details



# Junkers D.1.

Richard Crapp describes his latest scale masterpiece.  
Pictures by Tony van Geffen



Richard's Ju D.1. shared its maiden flight day with John Carpenter's Howard DGA-3 'Pete' and Dave Toyer's 27% Tiger Moth. A scale model feast!



Thin self-adhesive vinyl strips are used to represent the corrugations of the Junkers' construction

**M**y Junkers D.1. is a Balsa USA kit, and I brought it back as extra luggage on BA flight (£60) from visiting a modelling friend in Colorado.

The Ju D.1. was the world's first all metal monoplane and could do 140 mph. Built in collaboration with Fokker, only a few were finished before the war ended in 1918. The low wing layout met with some suspicion but it was said to be a fine flying aircraft.

The 1/4 scale model was built in 6 weeks. It is typical BASA USA construction – lots of chunky balsa, with ply where necessary. Some quite good construction ideas are used and we can all learn from a company with such a good and long pedigree. I particularly liked the square wing tube that joins the 3-piece wing with built up light ply boxes. The wing is 5" deep at the root.

I worked hard to keep the back end light but still had to add 4 lb of lead in the nose; total AUW is about 26 lb. There are a few more things I could have done to lighten the back further if I was to build it again. Having to add lead to the nose moves me to tears, but this can rarely be avoided with WW1 models.

The top cowl is held on with magnets and gives easy access to radio, engine and tank. The guns are held on with magnets to the fuselage to facilitate removing the cowl. The dummy engine has parts in the kit but I 'improved' it with the addition of a few springs and screws.

The entire model is 100% sheeted balsa. I used the optional thin vinyl strips to represent the corrugations of the Junkers' construction; it is supplied on a wide roll and is self-adhesive and only took a few hours to apply. Not sure if that is worth doing as it spoils the paint adhesion and weighs a bit extra but it does give quite a good representation – sort of! The balsa sheet is all glassed with .5 oz cloth.

The model was primed and painted in matt Klaskote and I hand masked the eight black crosses. I mixed my own KK colours; I modified the KK light and dark green but made my own mauve. It's MAUVE, not pink! There is no historical proof of the three colour camouflage scheme from that time anyway. Only educated guesses...

The cockpit wall inside has some litho corrugations made with an artist's paint tube squeezer – Google it...

The pilot is from Jim Reeves and his call-up papers were addressed to Herr Flik! The dummy engine has parts in the kit but I 'improved' it with the addition of a few springs and screws.

6" wheels are Williams vintage. I modified the undercarriage to have a working axle on some Mick Reeves bungee cord. Otherwise the only give is if it spreads and probably breaks.

**RCMW**





The Laser 300 V looks a bit messy, having been transferred from Richard's Swordfish, where it was 'blacked up' to disguise it



Neil Tiley gives a helping hand when starting the Laser. You can't have a better engine assistant than that!



Trundling out for the maiden flight



The Laser 300 V and 20" x 8" Xoar prop combination provides ample power



The model shows off its unusual wing shape during a banked turn



The underside camouflage colour works well!



Balsa USA offer an optional decal set but Richard decided to mask and paint the crosses



The 1/4 scale model was built and ready to fly in just six weeks



The Junkers D.1. gets a bit too close to the ground for comfort!



All ends well! The Ju D.1. taxis back after a successful first flight

## CONTACTS

### BALSA USA

[shop.balsausa.com/product\\_p/422.htm](http://shop.balsausa.com/product_p/422.htm)

### PEGASUS MODELS

Pegasus in the UK stock Balsa USA, but they don't have any stock of this kit at the moment of writing. You can pre-order at [www.pegasusmodels.co.uk](http://www.pegasusmodels.co.uk) (search for Junkers D-1)

### LASER ENGINES

My model is powered by a Laser 300 V with a 20" x 8" Xoar prop. It is ample power and fits in the space just nice. The engine bay would fit just about any engine up to 60 cc. My Laser looks a bit messy as it has done long service in the Swordfish, where it was 'blacked up' to hide it. [www.laserengines.com](http://www.laserengines.com)

### BOOMER RC

The model is guided by Multiplex 4000 R/C with some Hitec MW 602D Digitals and two 7.2 volt LiFe batteries from Boomer RC in Australia [www.boomarc.com/en](http://www.boomarc.com/en)

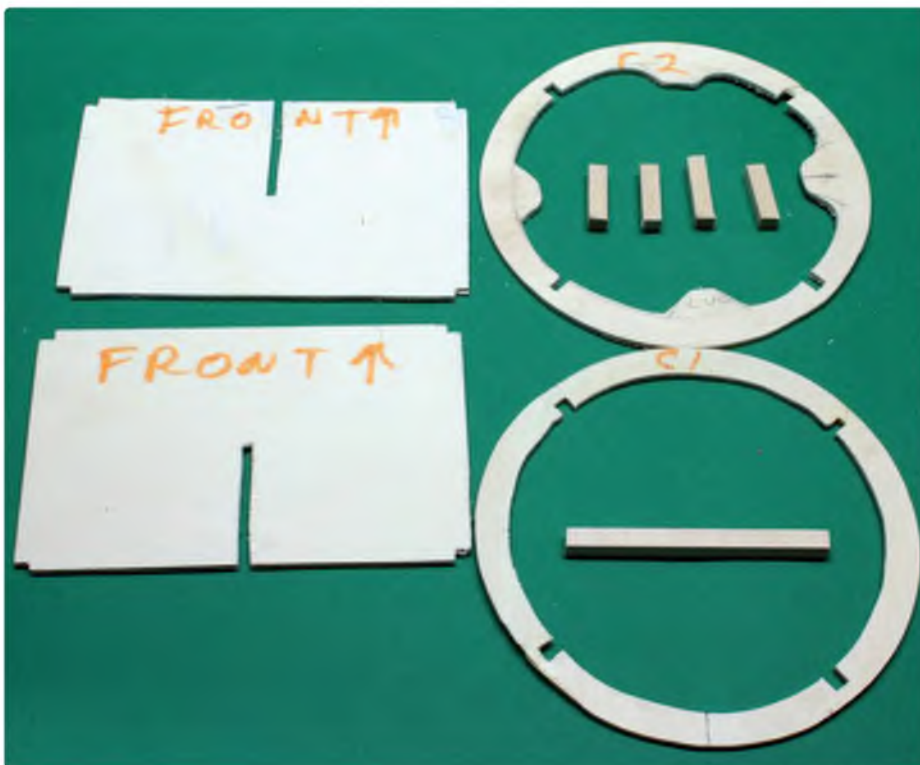
### RC SCALE BUILDER

There is a full build thread on RC Scale Builder forum. Enjoy!  
[www.rcscalebuilder.com/forum/forum\\_posts.asp?TID=24252&PN=1&TPN=1](http://www.rcscalebuilder.com/forum/forum_posts.asp?TID=24252&PN=1&TPN=1)



# Making A Round Cowl

Bill Bowne shows how to give a model a neatly rounded front end



Required ply parts. Not shown are the balsa block front and balsa side strip

**C**lassic biplanes have round engines. (Well, maybe we can bend that rule for the Tiger Moth and the Curtiss P-6E!) Unfortunately, it's often hard to find commercial cowlings to fit scratch-built models, so the 'tail may wag the dog' and

force a builder to scale his model to match an available cowling. For example, I recall a scale builder who designed his Bristol Bullet model to fit an aluminium cooking pot he found for the cowling. I'd prefer not to have my wife catch me in her pots and pans! So

the alternative is to build a custom cowling.

Plastic, fibreglass or metal cowlings work well, but are hard to fabricate and require a lot of extra work. Plus, they can't be covered with the same shrink-film used on the rest of the model. So, for my latest project (a Waco YKS), I decided to make a custom cowling from balsa and lite-ply. That way, I could cover the cowling with the same shrink-film as I used on the rest of the model. Plus, a wooden cowling is easier to repair.

## Parts List

The basic parts of our cowling are two ply rings (one with mounting lugs), some block for the front, a long strip of flexible balsa, two disposable jig panels (which can be from balsa, lite-ply or even foam board) and a few bits of scrap balsa or ply.

Start by measuring the required cowling diameter and length. We will be building a basic 'can' shaped cowling with balsa block (or foam, if you wish) forming the very front of the cowl. The longer the 'can' the less block you'll need on the front end.

How long does the side strip need to be? The circumference of a circle is the diameter times Pi. We will make it a bit longer, so I use 3.2 times the diameter. That leaves a little room for a good joint at the overlap.

When it comes time to make up the cowl front blocks, 22.5 degrees would be the 'correct' angle to cut them at. That way eight blocks would do for each layer for minimum wood wastage. But since most of us only have 45 and 90 degree mitre boxes the blocks shown are much easier to cut and fit!

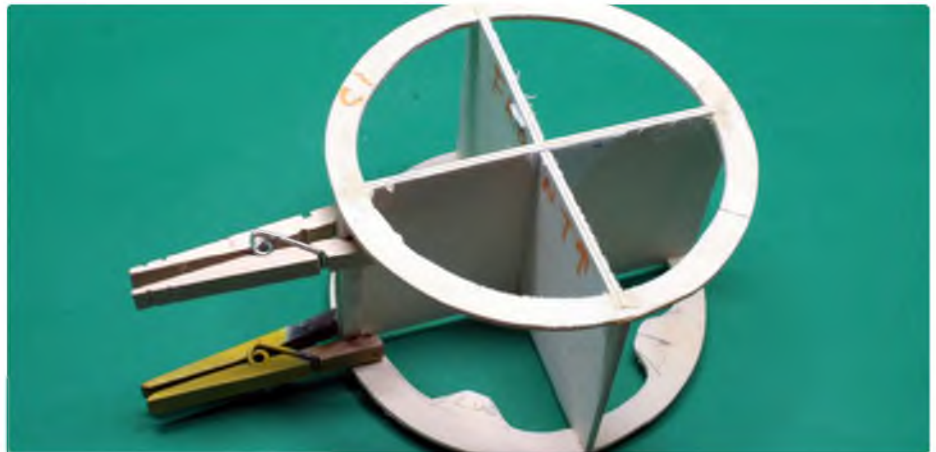




The two centre formers interlock. Use triangles when gluing to keep them square



Glue scrap block to the back of the aft former to allow the sides to overlap the cowling base. Choose the block size to fit the overlap you need for your model.



Cowl rings and the base anchor are glued to the jig. Can you guess why it makes me think of 'The Beautiful Blue Danube' waltz? (Think sci-fi!- KC)



Note that the balsa grain is perpendicular to the long axis of the balsa strip. Use a good solvent-based glue when joining bits of sheet together for easier sanding

#### Assembly Procedure

**1)** Glue the cowl jig panels together, using right-angle braces to keep them as square as possible.

**2)** Glue front and rear rings to the jig, then add the cowl bottom strip to one edge of the jig. This will be the bottom of the cowl.

**3)** Create the cowling side strip using flexible balsa. Trim the sides of each strip with a straight edge, hinge them with masking tape and run a bead of glue along the joint.

Cut the side strip a bit longer than you'll need to allow for an overlap (which will take place on the bottom, hence the extra strip down there!)

**4)** Glue one end of the strip to the middle of the anchor block.

**5)** Wet the OUTSIDE of the side strip. The wood cells will absorb the water and expand, causing the strip to bend. You don't need to soak it but you do want the wood visibly wet. I keep a small spray bottle of water in my workshop with a little vinegar mixed in,

to avoid new life forms evolving in my spray bottle!

**6)** Wrap the side strip around the jig and rings, gluing as you go. Cut through the overlap and glue the ends together. Wrap the cowl with a few winds of masking tape and let it dry COMPLETELY before proceeding. Please use a solvent based glue, such as Ambroid, when joining the side bits together. These glues make softer and easier to sand joints than cyano or aliphatic, so they're less likely to leave a hard ridge in your cowling



**MAKING A ROUND COWL**

7) Build the cowling front from soft balsa blocks (you may be able to use foam, if you're covering with low-temp shrink film) and sand it to shape. Exactly how much block to use depends on the cowling size you need. If you don't mind cutting out a bunch of little bits, a segment of cowling front is on the drawing. Overlap those 'blocks' as if you were building a brick wall, to avoid weak

spots. If the front block end grain keeps rising, apply a light coat of Balsaloc. Let it dry, then sand lightly. You'll find it not only keeps the grain from 'feathering' but it also helps anchor heatshrink covering film. Please don't use clear dope to avoid feathering as it may bubble and blister from the heat of your covering iron.

8) Use a coping saw to remove the jig, sand the front smooth, then pop off the aft scrap blocks.

9) I mounted my cowling via aft lugs and bolts. You may want to use magnets, screws or something else entirely. Cover with your favourite heatshrink film and you're done. Congratulations, you now have a light, strong and repairable cowling! **RCMW**



Glue the side strip to the middle of the anchor

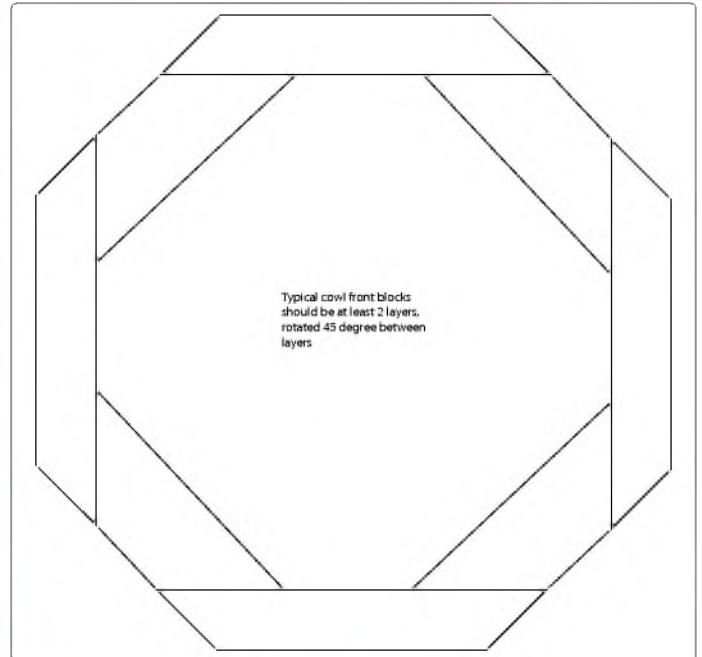


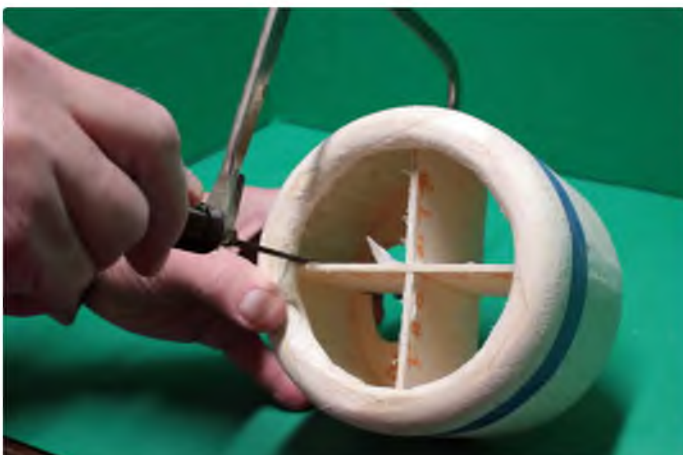
Fig 1



Wet the outside of the strip and wrap it around the rings, gluing as you go. Trim the end at the overlap, wrap with tape and let dry



Masking tape protects the sides whilst we sand the front block. Rings mark the desired outer and inner edges of the 'peak' of the cowling



Careful work with a coping saw makes cutting out the jig relatively easy



Finished and ready to cover



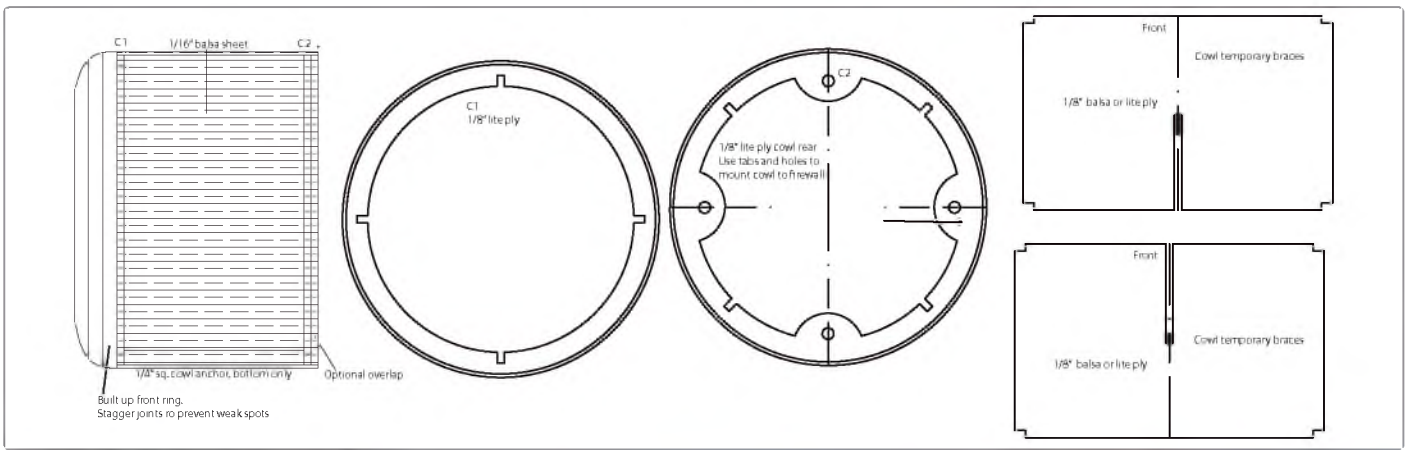


Fig 2 - The basic schematic of our cowling



You can cover it with the same heatshrink film used on the rest of the model. Plus, a wooden cowling is easier to repair. Waco plan coming soon!

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# North American T-28 Trojan

Our cover star for the April issue finally takes to the air.  
Words by Neville Hill and Jonty Walkenden, with flying photos  
by Ray Whittaker



**A**t last, after my longish trip to the other side of the world, and the Editor not being able to get onto the strip for the standing water and gale force winds, I arrived back to dry and sunny conditions. Perfect, so let's go and fly some review planes! I arranged for my 'test pilot' and flying buddy, Jonty Walkenden and trusty club photographer, Ray Whittaker to turn up to 'do the business'!

I had two models that needed flying, the North American T-28 Trojan from Seagull Models, for which you'll remember the build review in the April issue, and a Powerzone 383 foam electric glider, which will appear shortly in RC Model World.

Now for the T-28 Trojan, which is supplied and distributed by J Perkins. This model really does look the part, except for one thing – the kit has a fixed oleo landing gear.

Although it is kitted out for retracts to be fitted, they were not supplied. I may fit them later so it looks better when flying.

I set all of the control surface throws as per the assembly instructions, with the exception of the ailerons, for which I put differential in. I also added 50% exponential to all surfaces.

Re-checking the C of G, it was spot on, being 100 mm back from the front edge of the wing as per the recommendation for the furthestmost point. More on this later...

I had fitted a new O.S. 90 four-stroke engine and although two tanks of Model Techniques fuel had been ground run through it, I kept the needle valve setting on the rich side.

Jonty checked that all the surfaces were moving in the correct way and returned to neutral, and with the engine running fairly rich we were ready to go. Over to Jonty...

## Trojan Airborne

To get the C of G to its most forward point, Nev had added quite a lot of lead to the firewall, almost a 1 lb in fact. I will say now that a C of G of 100 mm from the LE is way too nose heavy. With a light breeze coming across our freshly mown and rolled strip at 45 degrees, I elected to go straight into wind, meaning there was much less of a run than normal. So the Trojan, with its engine running relatively rich and therefore not giving its best, accelerated in quite a leisurely manner. So much so I began to think it wasn't going to get off! However, a really hefty dose of up saw the nose wheel lift. Then, with the main gear just clipping the 'rough' at the strip's edge, off she went.

I immediately asked Nev to reach over and give me a stack of up trim, as I was having to constantly hold the stick back (Mode 1) to





Assembled and ready to go at the local flying field



A hefty dose of up saw the nose wheel lift and with the main gear just clipping the 'rough' off she went



The Seagull Models T-28 Trojan is a very capable sport scale model for everyday use

keep the nose up. Once he'd trimmed it to hold level flight without any input from me, it was time to see how the Trojan flew...

First off, I'll say this model looks really good in the air (albeit followed by a nice smoke trail), but it really cries out for retracts.

With the Trojan tracking around nicely the first thing to try was the stall, so dropping the power I slowed it down and kept a steady pull on the elevator until I had the stick hard back. The eventual stall was a complete non-event! All it did was to slow down nicely with the nose up, mush, then drop the nose and regain flying speed. There was no suggestion of dropping a wing whatsoever. No doubt the very forward C of G position helped out here, but it was quite flyable.

I then began to see what it could do, but not before a few passes had been made for Ray to take the photos.

Now, the Trojan has a bulky cowl and fuz, but otherwise has the proportions of the average sport model. So, sport aeros it was! Knife-edge was great, and will get even better with the C of G moved aft. All rolling manoeuvres, whether fast, slow (looks awesome) or point are effortless, but with the forward C of G inverted flight, and the inverted portions of rolls, required a huge amount of down elevator. This was always going to be the case but it wasn't a problem. Stall turns were easy and without needing a massive amount of throw, though the rates were set to the manual's high settings. I found it really quite enjoyable to be honest and the Trojan looked great to boot!

I tried the flaps for a few landing approaches and can say that they are very effective. It didn't need any elevator compensation, probably due to the C of G,

but the final approaches using flaps were really solid and it felt great.

It was at this point, just having done a low pass and applying some power, that the OS coughed a few times... Uh, oh! I was heading downwind, straight towards the road that borders our field. So I cut the throttle and set up to put her down as gently as I could in the rough at 45 degrees to the strip and really crosswind. This model really will fly slowly, even without the flaps down, so she settled down nicely without any fuss at all. The outfield 'arrival' took one of the main gear blocks out of the wing, but so cleanly that it should be a simple matter to epoxy it back in. No sweat!



**Summary**

This is a nice flying model that looks great in the air and will make a very capable, everyday good sport scale hack. I have no doubt that most kits will be assembled with the fixed undercart, but those with a good grass strip or tarmac (the lucky ones!) might find this is a good model in which to try their first retract set up.

Literally, the only thing I could find that I didn't like about the Trojan was the use of the wire pushrods with 'joggles' through the GRP control horns. This gives quite a large amount of slop in the linkage, which is only going to get worse with use, time and the vibration of a four-stroke. Personally, I'd use ball joints from the start but it's up to the individual.

My opinion? The Trojan's a good 'un!

**RCMW**



**Right:**  
Final approaches, with or without flaps, are slow and solid



With the new four-stroke puffing away at a rich setting, the T-28 avoids the scattered ovine obstacles in preparation for landing



It's a great looking model, which would really benefit from fitting retracts

**THE MODEL WORLD**

**MODEL INFORMATION**

<b>NAME:</b>	North American T-28 Trojan
<b>MANUFACTURER:</b>	Seagull Models
<b>DISTRIBUTOR:</b>	J. Perkins Distribution
<b>WEBSITE:</b>	www.jperkins.com/north-american-t-28-trojan-sea-258
<b>PRICE:</b>	£259.99 SRP
<b>MODEL TYPE:</b>	Semi-scale ARTF
<b>CONSTRUCTION:</b>	Built up, CNC cut balsa and ply, with matt Oracover covering
<b>PARTS SUPPLIED:</b>	Airframe with painted fibreglass cowl, two piece wing, oleo-style fixed tricycle undercarriage with retract option, bottom-hinged flaps
<b>PARTS REQUIRED:</b>	10-15 cc glow/petrol engine or 1200 to 1500 Watt electric motor, five channel (minimum) transmitter and receiver, propeller, seven standard servos (for IC version)
<b>ENGINE USED:</b>	O.S. 90 four-stroke

**MODEL SPECIFICATION**

<b>WINGSPAN:</b>	1600 mm (63.0")
<b>LENGTH:</b>	1287 mm (50.7")
<b>WEIGHT:</b>	4.0 kg (8.8-w9.9 lb)

**R/C FUNCTIONS**

- 1:** Throttle
- 2:** Ailerons (two servos)
- 3:** Elevator (with split pushrod for individual adjustment)
- 4:** Rudder (coupled to nosewheel, so use a heavy duty servo)
- 5:** Flaps (two servos)



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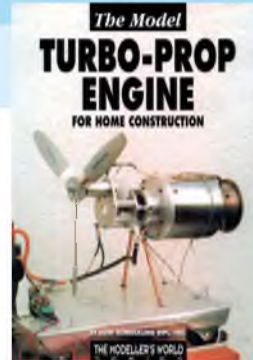
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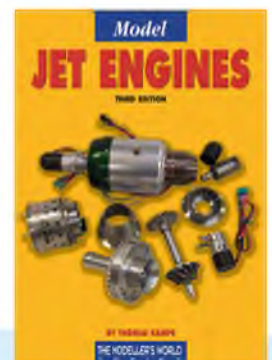
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# Magic In The Sky Over Provence

Michel Maisons reports on a well attended scale model show in Aix en Provence, France



Ledroit Thierry's C130 Hercules has a 4.8 m wingspan and is powered by four electric motors, 4800 watts. This beautiful model was drawn up from a Heller plastic kit and took about 700 working hours to complete



This Canadair by Mr Bellon, Club MAC Ribéron, spans 3.5 m and is powered by two electric motors, 3000 watts



Fly Eagle F16 powered by a 19 kg Frank turbine, 41 kg take-off weight. Scaled to 1:5.5, it is three metres long. The paint is aged with a mixture of black and brown gouache (opaque watercolour) – superb!

**W**hen the Model Air Club of Aix en Provence (MACAP) hosted its annual show in September, 2015 the meeting brought together scale modellers and experienced pilots from all over the PACA region (Provence-Alpes-Côte d'Azur).

They presented a wide spectrum of models, from the pioneers of aviation to the superior aeroplanes of modern times, not forgetting the warbirds of WWII. The flying displays were organised with meticulous attention.

## History Flashback

The Blériot XI, designed in 1907 by Louis Blériot, was the first aircraft to cross the channel. In its time the design was considered to be efficient and manoeuvrable. It was faithfully reproduced by Mr Bruchetelle from the AMR Brignoles club, including wing warping. Twisting of the trailing edge gives roll control of the machine. It must always be flown in calm weather due to the limited roll authority but the flight demonstrations showed incredible realism.

## Conquest Of The Skies

At Aix en Provenance several WWII warbirds were present. They flew in perfect co-ordination and looking as realistic as possible. Corsairs, with their gull wings, took off and in their slipstream came a P-47. We also saw a Spitfire and a Zero take to the skies.

A worthy successor to those times, an F-16 powered by a 19 kg thrust turbine, offered a dramatic demonstration of the operational capabilities of this 1/5 scale model. It looked stunning in the skies.

## True Model Makers

Some scale modellers prefer to buy highly prefabricated kits, such as those by Aviation Design, and then integrate the turbine and avionics.

For those who are only interested in flying they can buy ready made models from specialised companies such as RC Aeropassion in Cannes, owned by Nicolas Aubert, or Bernt Pötting in Germany. But there are also those who want to be called real model makers and who realise their dreams from scratch, using plans or designs based on plastic models (see Ledroit Thierry's C130 Hercules). All were present in some form or another.

## A Dose Of Adrenaline

Here in Provence there would be no magic in the sky without the amazing flight capabilities of the Bossion clan, and in particular Dunkan and his Extra. He brings 3D aerobatics to the fore in a sequence of spectacular manoeuvres, ending in clouds of smoke as a torque roll is attempted with the rudder close to the ground. This young pilot, only 18 years old, and his brother Jonathan, are internationally renowned and you can see why.

Thanks to all the participants and organisers, the Model Air Club of Aix en Provence were able to offer the public a stunning display of scale models, perhaps giving some novice pilots the desire to take their first steps into the world of R/C scale models.

**RCMW**





Duncan Bossion's Extra took part in the freestyle demo in breathtaking style!



Clouds of smoke as a 3D model torque rolls close to the runway



Bidule 11G flown by Bernard Claret, Chairman of LAG Helicopter Airbus. It is fitted with a DLE 116 petrol engine



Bruchetelle's Bleriot XI, a gorgeous model with wing warping for roll function using a 30 kg servo



Warbirds of the Second World War were represented by a P-47 Thunderbolt, two Corsairs, a Zero and a Spitfire



Other models of note were the Gee Bee and Space Walker



# Choosing An Autopilot

Wayne Andrews looks at some of the options available when choosing an autopilot for First Person View flying



A Cyclops Storm installed in a very well used and repaired 1 m Falcon wing

**F**lying an R/C plane for the first time using FPV is an exhilarating experience. Whether it's simply being able to see your flying field for the first time from the air, the feeling of skimming the ground at high speed, or holding your breath to squeeze through that little gap between two trees.

As we fly FPV more we are inevitably drawn towards more distant goals – the “I wonder if I can reach that group of trees?” syndrome. The shortcomings of flying a plane for aerial video then become more apparent. You may have a great pan/tilt system set-up for your camera but it's hard to concentrate on using it to frame up your subject when all your efforts are going into keeping your plane straight and level.

Whether thinking about venturing out further, getting steadier video or just helping your navigation, fitting an autopilot to your plane may be that next step to help.

## What Is An Autopilot?

Put very broadly it's a device that will take control of your model plane in some way, when you ask it to. Instead of your receiver connecting directly to your servos to move your surfaces, both the servo leads from your receiver and the servos plug into the autopilot. In Manual mode it will pass your inputs from the receiver straight through to the servos, whilst in Order mode it will do a certain amount of its own thing.

One of the big reasons people invest in an autopilot is the added safety it provides if you lose video or your R/C signal, when your aeroplane should return to you. The way RTH (Return To Home) is set up depends on the receiver's failsafe settings – you will need to engage the mode switches to put the autopilot into RTH mode and, if necessary, the appropriate amount of throttle and set the failsafe in this position so that your model engages RTH should it lose the signal from your transmitter.

All autopilots are a little different in how they work but most have a common set of features. We're going to be looking at four different autopilots in a range of prices and which all have at least three of the most useful and important features that you should look for. These are:

## Stabilised Flight Mode

Putting an aeroplane in stabilised mode should hold its heading and altitude. It's a great tool for letting go of the sticks for short periods and concentrating on pointing your camera at a point of interest. This works by the gyro sensor detecting pitch and roll changes, and then putting in the appropriate counter inputs to the control surfaces to correct these. Since all planes handle differently in their responsiveness this often involves some initial tuning. For example, a too small a gain on your ailerons will result in

the plane lazily rolling back and forth, trying to stabilise, whilst too high a gain will result in oscillation of the wings.

## Return To Home

This is a very useful safety feature when set up correctly, although it should be tested regularly before trusting your plane to it. This feature works by getting a GPS reference of your launch site and, when activated, getting the plane back to that reference point. Unlike a multicopter RTH the aeroplane won't attempt to land but will circle above you at a designated altitude, letting you take visual control if necessary so that you can land it safely.

## OSD Facility

Having these great flight modes is all very good, but so is also being able to know what mode your autopilot is in, which direction is back home, your model's height, speed, how much battery power is left, etc. It is all very useful information and so should be considered a must in any AP.

## Will An Autopilot Fix A Poor Flying Model?

An autopilot is not a magic bullet to make your plane fly perfectly. So before considering fitting an autopilot your aeroplane should be flying predictably and well, free from excess vibration and have room to fit the AP, ideally right on the C of G balance point.



## Ardupilot

Ardupilot is the grand-old lady of autopilots, with its initial release in 2009. It's an open source project, initially developed in association with 3D Robotics, which also sold the hardware to run this code. Due to its open source design and abundance of cheap Chinese clones, the list of compatible hardware is vast. But we'll concentrate on the most popular, the APM 2.x controller, which is based on an 8-bit CPU with limited memory, and the higher performance Pixhawk controller.

Ardupilot is unique in that it's such an open platform for development, and as such it isn't just used to fly aeroplanes. There's well developed code for multicopters, rovers (land vehicles), as well as the slightly more experimental stuff such as quads transitioning into planes.

As an autopilot, Ardu is fairly well featured. It has several different stabilised flight modes, the most useful being FLY\_BY\_WIRE\_A in which it will hold level pitch and roll. Throttle in this mode is handled manually. This is expanded with FLY\_BY\_WIRE\_B, which also holds altitude and controls the throttle, as well as using the elevator to do so. CRUISE mode goes one stage further and adds a heading hold function. As well as RTH, Ardu is also equipped with a LOITER mode, which makes the model fly in a circle wherever you engage it. This is useful if you need to remove your FPV goggles and sort something out.

Where Ardupilot comes into its own is with its autonomous flight modes. With the choice of two versions of its ground control software, Mission Planner or Ardu Planner, you can simply mouse click on a map for a series of way points, and decide on the altitude and speed of each leg. The data can be uploaded via USB connection from a computer, or using data radios it can be transmitted to the model, even while it is flying. The use of a data radio also gives a link back to your base, so the plane's current position and other information can be shown interactively on a map.

Using the mission planner you can even ask your plane to take - off or land completely autonomously, but you need to plan your route carefully for the landing approach. The same software and interface is used to control the tuning functions in order to get your aeroplane flying as smoothly as possible.

If this is all sounding too good to be true, well it may well be. It depends on quite how



A particularly busy ArduPilot OSD configuration in autonomous mode in its way to waypoint 4 (photo courtesy of Neil Brooks)



Ardupilot installed in the belly of a SkyWalker (photo courtesy of Neil Brooks)

much effort you want to put into getting the system ready, because 'plug-and-play' this is not! You will need to spend some time downloading, installing and tweaking the firmware to suit your exact requirements.

The OSD (On Screen Display) isn't an integrated part of the system - it's a very cheap add on and is called the MinimOSD. But once again expect to put time into firmware flashing the OSD, using a Graphical User Interface (GUI) to decide what you want on-screen, because the amount of information you can have displayed is so much it will obscure your picture.

Support is community based, which can be hit or miss depending on the sort of issue you

have. But if you do enjoy getting involved in the more technical aspects of autopilots you can always dig into the source code yourself and write your own enhancements.

**Verdict:** If you want ultimate control of how your autopilot works and enjoy the thought of tweaking values and recompiling in your own firmware this is right up your street. It's also the only one of the autopilots on test that handles a serious amount of waypoints.

**Best Price Found:** APM 2.8 hardware, data radios, GPS, OSD, £70 banggood.com  
Pixhawk 2.4.5 hardware, data radios, GPS, OSD, £154 banggood.com

## Cyclops Storm And Tornado OSD

The Cyclops Storm was a very popular autopilot/integrated OSD for several years. It's been superseded now by the Tornado. But as the Storm is still available to buy and is cheaper it shouldn't be ignored.

Both systems are pleasantly easy to set-up. The main unit comes in a bright blue case with all its pins clearly labelled, so there should be no confusion about which leads connect to where. The kit comes with a current sensor, a GPS receiver and a small five-buttoned control pad for going through the menu screens or entering data.

The Storm and Tornado are easy to run off a single 3S flight LiPo. It will take power via the current sensor and provide a 12 V output

to your FPV camera. If you want to run your plane with 4S or more you can still connect to the current sensor to provide a reading, but you will need to give the autopilot a 12 V supply separately.

The main difference between the Storm and Tornado is the amount of control that it will offer on your plane. While the Storm just had Aileron/Elevator in/out (you need to handle the throttle control yourself) the Tornado adds Throttle/Rudder in/out to the list and also boasts an airspeed sensor, although the pitot tube needs to be purchased separately. This is a more intelligent way of operating as before you would have to give your failsafe a certain amount of throttle that you'd need to know would work okay in both a tailwind

or headwind. With the airspeed sensor you can give the Tornado your plane's min/max speed, as well as the speed you want it to cruise at.

There's also flight logging via a micro SD card. You can take the data from a flight and convert it to a KML file, which you can use to show your flight overlaid onto Google maps.

Less impressive is the Tornado's implementation of waypoints. Rather than letting way points be selected as GPS references from a map, the Tornado lets you set up to eight waypoints from the reference of your start point. So 'go 400 m on a course of 90 degrees at an altitude of 50 m', for example. This has to be entered via the configuration screen using the little control



## CHOOSING AN AUTOPILOT

pad so it is quite fiddly and not particularly useful.

The Tornado has four flight modes: Manual (in which the autopilot does nothing, but the OSD is obviously still available), PA (Pilot Assist) in which the plane is stabilised and heading/altitude is held, AutoPilot (the waypoint mode as described above) and RTH (The Storm Manual/PA/RTH). These are simply set-up on a few switches on your transmitter.

In flight it's a nicely designed system. The OSD gives a clear display of your speed, altitude, heading, GPS strength, battery levels etc. While it's not configurable in terms of how things are laid out, it has a few options to turn the Artificial Horizon Indicator (AHI) on or off, and you can switch between the full OSD, a more minimal one or turn it off entirely.

**Verdict:** It lacks some of the more advanced features that some of the other AP's have but it is a solid and well respected system that comes in at a very attractive price. The Cyclops systems do not like vibrations and if the AP gets shaken around it'll display a symbol until it recovers, during which time the AP will not function well.

**Best Price Found:** Storm £68/Tornado £88  
goodluckbuy.com



Using stabilisation to pan the camera over the wing using a Storm in a Bixler 2

## MyFlyDream

One of the newer AP systems, the MFD is gaining a great reputation for itself and it has a few features that are proving useful to many an FPV pilot.

The system comes with the main unit, which is quite chunky at about double the depth of the Tornado OSD, a 100 A current sensor, a GPS receiver, a tool to update the firmware and some useful shielded cables for connection to your camera and VTX. One of the must have additions to get the most from this system is the separately available airspeed sensor and pitot tube, which plugs directly in.

Looking at the pin side of the AP you will see a slightly intimidating set of pins – 60 of them arranged as a 5 x 12 grid. Whilst they are labelled in a sense it would have been much more sensible for MyFlyDream to section off, or at least colour code, some sections. As there are some 12 V and 5 V rails practically on top of one another, wiring up is something that needs some careful time and attention.

There are a huge number of parameters that can be adjusted for your plane but usefully, within the unit, MFD have provided some templates for some popular planes. So it's a simple starting point to pick the most similar template to the model that you are flying and go forward from there.

What's nice about the MFD AP is that you can go through all the menu settings using your transmitter. You enter the menu by holding a stick in a set position and then moving a switch. At this point you use you the elevator/aileron stick to navigate around the many pages of menus and change values as appropriate.

Whilst you can't enter the menus in flight the system does allow in-flight tuning, which is an excellent way of getting your plane to fly very smoothly quickly. It does this by using



Using the MFD and adjusting the roll and pitch gains whilst in flight

two of the channels for adjustments and are best designated to the rotary knobs on your transmitter. It allows you to fly around and get the best setting you can, then land and save the values.

Mode wise the MFD AP has manual, stabilise, waypoint, circle mode and RTH. Waypoint mode is implemented in same same way as the Ardupilot, so the Mission Planner software can be used to select your waypoints, but only to a maximum of 10.

Beauty is in the eye of the beholder of course, but I don't find the MFD AP's OSD layout to be particularly inspiring. Crucially, it does tell you all you need to know but it's just not particularly pretty, nor is it configurable.

One of the more useful features of the MFD AP is its launch mode, which is often used by pilots throwing larger planes into the air that require two hands without touching the transmitter. As soon as you've put the necessary stick combination in to enter launch mode, you simply need to throttle up and throw. The AP will then stabilise the plane in flight and pitch the nose up to a configurable angle and fly away unaided!

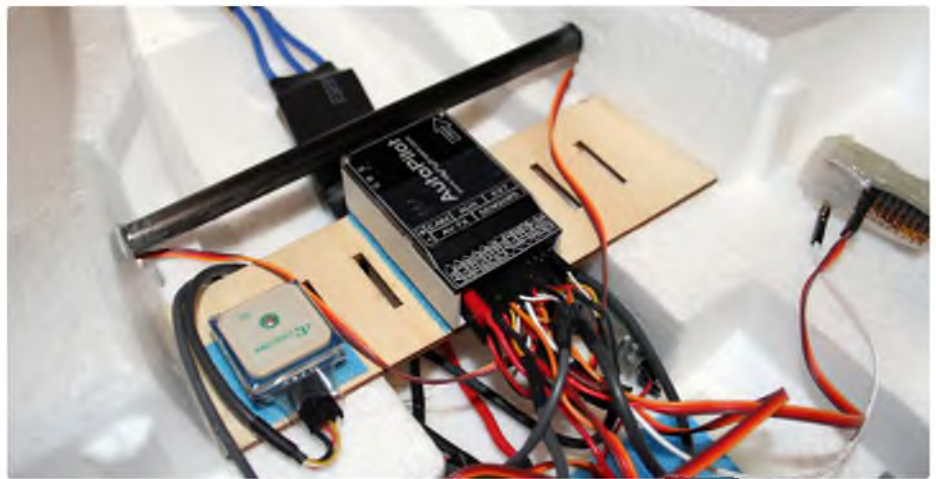
Another feature of interest to the more hardened FPV'er is the MFD AP's ability to talk to MyFlyDream's own brand of auto antenna tracker (AAT), thus allowing the pilot to use a higher gain direction antenna always pointed at the plane.



On the negative side, whilst MyFlyDream did use to be quite proactive in both forums and responding to issues, this has all but ceased. So if you buy one make sure you buy from a good known supplier who will be able to offer you support should something go wrong.

**Verdict:** The launch mode and compatibility with the MFD AAT make it very useful for people with models that are more awkward to get in the air and are flying in places where a simple skew antenna isn't going to cut it. The flight performance is excellent and the in-flight tuning makes getting set-up easy. Where the system isn't great is in its fiddly design, and its size makes it quite a squeeze in smaller aeroplanes.

**Best Price Found:** £130, hobbywow.com



MFD installed in the large canopy area of a Zeta Science Buffalo FX-79 Wing

### Eagletree Vector

Pre-release, one of the Vector's most pushed features was the fact it had an OSD in colour, which, at the time, sounded like a bit of a gimmick. However, colour is really just the tip of the iceberg in this extremely full-functioned AP.

As per many of the other APs, the main flight controller, current sensor and GPS are included in the package, with an airspeed sensor and pitot tube being an additional but very useful accessory.

Unlike the MFD AP, connecting up the Vector is less prone to issues. It uses dedicated wire harness connections for everything but the servo outputs for your aeroplane's surfaces. The Vector is also able to function as a multirotor AP and even boasts that you can quickly swap it between models without the use of a computer. But quite how simple it is to dig it out of the guts of your plane and transfer it over for a quick quad flight is questionable.

Although the Vector promises that you can fly 'out of the box' it's the level of customisation that is most impressive on the AP. Using Eagletree's own software you can tailor the OSD to look exactly how you want it to, showing as much or as little data as you require, in whatever colour you want, and using number based info or gauges to give empty/full indicators.

Flying modes are nicely catered for with basic stabilisation, stabilisation with heading and altitude hold, Loiter (circle mode) and, of course, RTH.

Changes to OSD settings are handled completely by entering the menus using stick/switch positions, which you can even do in-flight (the model goes into stabilised flight). Gain adjustment in flight is also handled via a potentiometer (rotary) knob, making the set up and tuning of your plane very easy.

You can set up to 26 waypoints in the Vector's software but at this time it doesn't fly to them autonomously. Instead it displays them on screen, allowing you to fly to them manually, which is useful for navigation. But the lack of autonomous flight is surprising for an AP this feature rich.

Another nice feature is the Vector's data logging. After a flight you can load the flight data into the Vector software and look at your flight path on a map, check the log of status messages, examine motor voltage over time and a host of other data. It's probably not

something you'd look at after every flight but it can be particularly useful if something went wrong during a flight and you were trying to work out what the cause might have been.

The only other downsides to the Vector compared to the MFD is the lack of launch mode, and the more complex arrangement of connecting to an AAT. It supports the EagleTree EagleEyes ground station, which in turn can connect to a pan/tilt servo based tracker.

**Verdict:** The Vector is the most developed AP on the list and is very feature rich, with new developments in progress. Features do come at a premium though and this is

the most expensive AP on test. The price, and the lack of a good 'plug-and-play' AAT solution are the only potential issues you'll face.

**Best Price Found:** £168, readymaderc.com

### Conclusion

It would be great to recommend one of these autopilots as 'the best', but one key does not fit all. All the autopilots discussed are very capable but as to which one is for you, it all depends on what you want to get out of it, which features you need/want, your budget, and the amount of available space you have to install it. **RCMW**



Vector installed in the ESC bay of a Skywalker (photo courtesy of Chris Blackburn)



The Vector in flight, holding very level (photo courtesy of Chris Blackburn)



# World Air Games

The aviation equivalent of the Olympic Games took place in Dubai in early December, 2015. Donatas Paužuolis, the Gold Medal winner in F3P Indoor Aerobatics, gives us a flavour of what it was like to participate in this exciting event. With additional pictures by Esa Eirola and Ričardas Šiumbrys



The organisers put in a lot of effort to provide great entertainment for the spectators during WAG. Impressive watersport (Fly Board World Cup) competitions were organised in the Marina next to Palm DZ airfield



A lot of modern and classic cars were decorated with WAG logos

The World Air Games is the FAI's (Fédération Aéronautique Internationale) flagship event. For many pilots it is more important than any other aviation event, including the World Championships. To date four successful WAG events have been organised, Turkey, Spain, Italy and now the UAE in 2015. This event combines all air sports and gathers the best of the best from full size aerobatics, aeromodelling, aerostats (ballooning and airships), amateur built and experimental aircraft, general aviation, gliding, microlights, parachuting, paragliding, rotorcraft and paramotors. The most attractive and dynamic categories are selected from each discipline. They must be entertaining for spectators and at same time attractive to the media and sponsors. In general the WAG's mission is to promote interesting and safe aviation, and

to encourage new generations to take part in air sports.

## Dubai

The city of Dubai is located on the Emirate's northern coastline. Today less than 5% of the Emirate's revenue comes from oil and its western style business model drives its economy. The main revenues now come from tourism, aviation, real estate and financial services. Dubai has attracted attention through many innovative construction projects and sporting events. The city has become iconic for its skyscrapers and high-rise buildings, in particular the world's tallest building – the Burj Khalifa.

Next to this impressive building, in the ice rink of Dubai Mall (the world's biggest shopping mall) the WAG F3P-AM class

was held. During the opening ceremony the director of the organising committee, Mr. Yousif Hassan Al Hammadi, mentioned that over 400 sporting events take place in the UAE each year. Grouping the World Air Games next to Formula One, Davis Cup tennis and other top sporting events is something that R/C enthusiasts should be very excited about!

During WAG a big announcement was made: in 2016 Dubai launched the million dollar World Drone Prix. The World Drone Prix is the biggest race of its kind, bringing together the best pilots in the world to go head-to-head and push the drone industry to seek more innovations and improvements. The World Drone Prix offered a total prize of 1 million US dollars, making it the largest such event of its kind in the world.





There's a great beach next to the Palm DZ airfield You could not ask for more – blue sky, sun, warm weather and working WiFi right on the beach!



Spectator seating

### WAG Organisation

You could expect that such a range of huge events would have a little bit of chaos and not everything would be done perfectly. The official WAG website did not provide all necessary information, such as athlete profiles and accurate information about each class and the event schedules. But once we arrived we saw that everything was under control and very well prepared.

After we landed we found the WAG stand, manned by a very helpful gentleman. He provided us with all necessary information and helped us through passport control, customs and baggage claim. Once all the procedures were finalised we were given transportation to our hotel. Our big box containing R/C planes could not fit in the car, so a bigger car was requested and it arrived immediately. We reached our hotel less than

an hour after landing in Dubai. Excellent work!

In the hotel we had couple days to check out our equipment, relax and enjoy the Dubai sun. Before our practice day we registered at the Palm DZ airfield. Registration was very well organised and we quickly received our passes and were ready for practice and competition. On the first practice day we visited the Dubai Mall. Our goal was first to test the aeroplanes after the long trip, and second was to test the music system and give the judges a chance to get familiar with our routines.

Practice time was limited. Each pilot had a total of five minutes, to include a one minute trimming flight and two 2-minute routines to music. On the same day a briefing and start order draw took place in the ice skating arena.

In the practice session everything went well, except for some small problems with the sound system. I must mention Mr. Antonis Papadopoulos (CIAM president) and Bernhard Schaden (Contest Director, F3P) and his team, who put a lot of effort in to solve any problems. During the event there was not a single issue, but I heard that in other disciplines problems were not solved so efficiently. We are really lucky to have such motivated people taking care of everything in the aeromodelling arena!

After practice the ice skating rink was immediately given back to the mall visitors; the same thing happened each day after our competition. I must say that the location was excellent. Putting on an indoor event in probably the most visited place in Dubai was a smart decision. Many people saw a small piece of WAG and were motivated to





The WAG opening ceremony was outstanding



Aerobatic gliders put on an impressive and memorable show



Action cameras are not just for models!



Aude Lemordant from France flying her stunning new Extra 300SC



The autogyro competition

visit airfields all over Dubai to see the other outside events over the next 11 days.

### General Aviation Events And Show

Most WAG events took place at the Palm Drop Zone airfield. The sky was full of non-stop action; one contest followed another from early in the morning until the sun went down. For me the most attractive flying was performed by the aerobatic gliders and powered aeroplanes, and their pilots. It was pleasure to see Champions fighting Champions in the most advanced flying machines!

On top of that it was quite entertaining to see take-offs and landings performed on a runway that is built into the sea! From a glider's cockpit it looked quite dramatic, bearing in mind the narrow space and no second chance on the landing approach. Naturally, such high-class pilots flew perfectly and none of them had problems with this.

The competition activities attract quite large numbers of spectators. They were well entertained and both young and old could find something interesting to do at the airfield. If you got tired of looking at the sky, you could switch and look at the action in the Marina's waters; a three day long World Cup competition for Fly Boarding was held on the shores of the airfield. Top athletes from all over the world showcased crazy possibilities



Zoltan Vares and his two wingmen

in this new and emerging sport.

Naturally, the highlight of the day at the main field was the amazing air show. It included several world class spectacles. Opening the show was the Breitling wing walking formation team flight, using two gorgeous Stearman biplanes, which carried two brave and great looking girls into the sky over Dubai. I highly recommend you look at the YouTube videos by doing search of: 'FAI World Air Games 2015: Breitling Wingwalkers over Dubai'.

Another world famous act was the Jetman team, performing group flights with the Zoltan aerobatic team. It was quite crazy to see three aerobatic planes and two humans flying wing to wing in close formation! Yves Rossy (creator of the Jetman concept) and Vince Reffet's flying is quite closely connected to aeromodelling. They use R/C jet turbines and the wing is built with similar technology to our models. These two gentleman sure give a new meaning to the term human flight! You probably saw them making a formation flight with an Emirates Airbus A380. This viral video has had over 18 millions view in less than 3 months!

However, the highlight of each show was the Al Fursan (The Knights) aerobatic demonstration team of the United Arab Emirates Air Forces. Their formation is made up of seven Aermacchi MB-339 jets,

each of them representing one of the seven Emirates. All aircraft are painted in black with gold stripes; black represents oil and gold the desert sand. The bottom of each wing is painted in the UAE flag. I've seen several jet formation teams and the UAE team left the best impression so far! (*That's fighting talk when writing to a largely UK audience, Donatas. I'm sure the Red Arrows will forgive you! – KC*) Precision, rich smoke and daring manoeuvres – they were outstanding! The organisers were very generous and the Al Fursan team performed their show routine almost every evening after the day's games in the sky had ended.

### Aeromodelling At WAG

Aeromodelling was represented by four different categories: F3N – R/C helicopter freestyle, F3T – semi-scale pylon racing models, F2D – control line combat and F3P – indoor R/C aerobatic models flying to music (also known as Aeromusical). Naturally, I will concentrate on the F3P class since I took part in it and saw all the action, starting from preparation to the award ceremony.

F3P class had the honour to be the very first WAG event and start the competition cycle, even before official WAG opening ceremony was held. In 2009 Torino, Italy the WAG indoor Aeromusical was the most successful event and it demonstrated great





My model reached Dubai in great shape. However, close inspection at the hotel was necessary to be sure that everything was in perfect condition



The huge ice rink provided a great place to fly for participants, and for spectators to enjoy the show



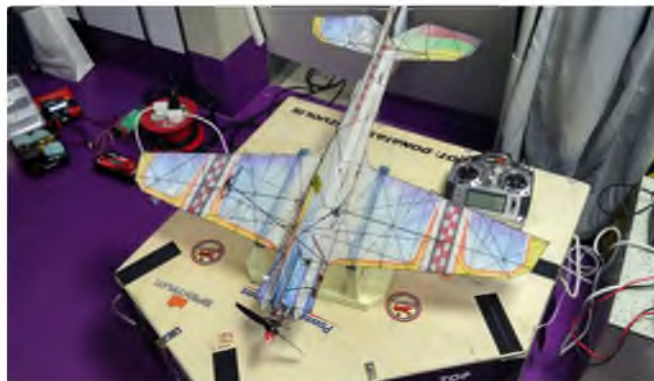
USA pilot, RJ Gritter preparing for a practice flight. On the left is another competition pilot and RJ's friend, Devin McGrath



Aeromusical aircraft of French pilot Julien Hecht



Italian Filippo Materazzi and his father prepare their model for flight



Left: The author's aeroplane ready for the competition. The transportation box becomes quite a useful table!

potential to attract media and spectators.

For those of you who are not familiar with F3P Aeromusical competitions I will try to describe the concept and the main goals that we, as pilots, try to achieve. We use light and agile aerobatic planes, mostly built from Depron foam. These models have almost unlimited flight characteristics, especially when they are equipped with variable pitch propellers and have vectored thrust control.

Flights must be combined with music, each pilot creating his own routine. Participants are awarded scores based on nine criteria: flying style, precision, utilisation of flight performance, variety of manoeuvres, artistic quality, reflection of the mood of music and overall impression created through utilising manoeuvres and continuity of schedule. The highest coefficient is given for flight synchronisation to the music.

The WAG 2015 judging panel consisted of three well known international judges: Peter Uhlig (Germany), Esa Eirola (Finland) and Harry Ells (Canada).

Compared to full size aviation or big outdoor R/C models F3P planes have noticeable advantages. They do not require an airfield and can be demonstrated anywhere in the city where there is a decent size arena or concert hall. The ice skating rink in Dubai Mall attracts a large number of people everyday, so demonstrating our

attractive models in front of the huge crowd was good promotion for the upcoming WAG events.

After practice the two day competition followed, with two rounds each day. Each pilot had to create two different routines. This was done in order to avoid repetition of the same music and flights, and to make our contest as attractive as possible.

It worked perfectly as big crowds of people followed the competition from the spectator seats and balconies surrounding the arena. The contest had two professional announcers, one talking to the crowd in English, the other in Arabic. The announcers introduced the audience to the judges' work and all the criteria taken into consideration during each flight.

A smoothly working live scoring system, developed by Bernhard Schaden, was used in the F3P event. Points awarded were shown, not only on the Internet (allowing all the world to follow the event), but also on the huge 20 x 10 metre LED screen in the arena. Spectators had a very good understanding about what was going on during the competition because of the interesting comments and results posted right after each flight. And the flight replays in slow motion on the massive screen were also a nice touch. Complete pilot rankings were also posted after each round. A lot of media was working

inside the arena to cover event, and for sure it is not something you will see during a normal F3P competition!

In two competition days each pilot flew four flights: two flights of routine A and two flights of routine B. For the final result the best flight from each routine counted. All my hard work paid off as I managed to win all four rounds! Alan Goljevcek from Slovenia was second with 1894,56 points and Devin McGrath from the USA took third place with 1844,89.

### Personal Preparation

Now I would like to share some details on my personal preparation for this competition. I will admit that I take this kind of event very seriously and if I decide to participate I do it the right way. Early preparation started about six months prior to the event with the search for the right music. Next step was the selection of a suitable practice area. Before this competition I heard rumours that the ice skating rink was really big (35 x 70 m) and unusually high, plus it had an air conditioning system working all the time. So I knew I needed to expect a windy and unusual flying space.

Normally we compete in smaller halls in Europe, so I knew that a small hall would not give me the chance to create a 'big' Aeromusical routine. I found information about the exact size of the hall online, then





UK pilot Steve Schafer (leaning on box) and his helper



WAG 2015 F3P pilots, from left to right, top row: RJ Gritter (USA), Marek Plichta (Czech Republic), Piotr Kowalski (Poland), Denis Heskamp (Germany), Steve Schafer (UK), Filippo Materazzi (Italy), Donatas Pauzuolis (Lithuania), Devin McGrath (USA). From left to right, bottom row: Alan Goljevcek (Slovenia), Andres Leoni (Spain), Christian Opplinger (Switzerland) and Julien Hecht (France)



A huge 20 x 10 metre screen showed the individual scores as well as competition standings



A proud moment for the author – his second WAG Champion title. It was an honour to hear the Lithuanian national anthem



Left: The schedule was tight in all events and any available time had to be used efficiently. The F2D pits were quite busy with preparation



Right: Dementiev Igor from Moldova had bad luck as his model escaped during C/L Combat, with the model crashing into the nearby water

I was lucky enough to make arrangements to practice in a very similar hall in Vilnius that was just a five minute walk from my apartment.

Last, but not least, was proper model and equipment selection. At this point I remembered my conversation with Christophe Paysant-Le Roux (eight times World F3A Champion). I asked Christophe what it takes to become a new World Champion? Christophe replied that aerobatics is not a timed sport, so in order to impress and convince the judges you have to be noticeably better than your main opponents. Aerobatic sport has a lot in common with figure skating. You need to convince all judges that your flight is the best, and this includes various small details. It is easier to say than to actually do it. Today many young, talented pilots practise hard and use the best equipment available. However, F3P is still a 'young' class and it has lots of potential for development and model building technology.

In the last couple of years, together with my friend Alexey Lantsov from St. Petersburg, we have experimented with modern building materials and glues. In indoor pattern competitions we replaced Depron as the building material with much lighter and stronger carbon tubes and rods. WAG was

the perfect chance to push myself forward and make an experimental model from carbon for the Aeromusical class as well.

It was quite a difficult task. In two minute flights to music Aeromusical planes face much larger loadings and stresses (during high G manoeuvres) in comparison to a slow classic pattern plane. On top of this AM models have to be built very strongly, not only for normal flight but also to cope with all unexpected forces during backward flight with their variable pitch propellers.

Model building took a ridiculous amount of time – 460 hours of work, from drawing until the first test flight. This is equal to six weeks without weekend breaks and working no less than 10 hours a day. In total I used about 70 metres of various thin carbon tubes and rods in this model. The goal was to have about a 10-15% bigger plane than usual, with the same or lower ready to fly weight, and at same time use the best equipment available today, including more powerful 3S (12.6 volt) LiPo batteries.

The final result was great – 158 g ready to fly, with lots of thrust when flying forwards and backwards. In comparison smaller Depron models usually weigh 155-170 g with a smaller battery. The bigger model but the same weight meant that I had reached a lower wing loading and I was able to perform

graceful manoeuvres better, such as slow, flat spins. And once the music changed to a faster rhythm, I could push the throttle forward and the plane would reach top speed and perform high-energy manoeuvres in a blink of an eye.

In addition to this the carbon model became noticeably stronger and rigid, so it performed all my figures with higher precision. On top of that the stronger model allowed me to experiment and try new moves without fear of damaging the plane (even in case of a small crash). After some experiments I was able to create a new manoeuvre, a backward take-off. All this allowed me to better follow the judging criteria.

Now I can call this model a risky experiment that worked out perfectly. F3P is a technical sport and there are plenty of components that can break or fail. So if something goes wrong in a competition and the pilot is not able to finish his flight he receives a zero score. My 'Arrow Competition Special' was such a time consuming project that I was simply not able to have a backup plane available. So if something did go wrong, I would be out of the competition without a chance to return. But pretty much every other competitor had two planes (a main and back up) ready to fly.

I am sure I will remember WAG as a very





Audrius Rastenis (World and European F2D Champion) preparing his models for flight



TVCVPP (Thrust Vector and Variable Pitch Combination) provides the chance to invent new and crazy manoeuvres. This system was designed by Martin Muller, godfather of indoor flight, for the 2009 World Air Games in Italy. Six out of the 12 pilots in Dubai used this system. An AXI2204/EVP motor is used together with 8 inch Mammo Models VPP upside down unit. It was controlled by a Castle Creation Talon 15 A ESC

pleasant moment in my life. It was quite an interesting experience visiting this exotic country. It's not everyday you get chance to fly over cold ice with a warm jacket on when the weather temperature outside was way above 20 degrees!

**Conclusion**

For this World Air Games the Emirates Aerospots Federation, the city of Dubai and the FAI did outstanding work and raised the bar in every single aspect. Everything from arrival until departure was perfect. Transportation inside the country, accommodation, a spectacular opening ceremony, the Gala Dinner, great food each day and the fantastic air shows were provided free for each athlete and a helper. It was all done on a very impressive scale, with over 1200 participants, 26 different disciplines and 56 countries represented. The events were held in six different and great locations, and as the 2015 WAG moto stated – [The] Sky is our stadium! In fact you could really feel it, as for almost two weeks Dubai's sky was full of the finest flying imaginable.

In the spirit of the Olympics the event torch made the long trip around the world. On 28th May it started its journey from Lausanne, Switzerland and ended up in the UAE for



A gallery of F3T racing models

the opening ceremony on 3rd of December. The torch travelled around the globe, visiting Spain, the Netherlands, Botswana, Italy, the USA, South Korea, Japan and Saudi Arabia, inviting citizens from all over the world to the World Air Games in Dubai 2015.

The organisers also put in a major effort to make WAG very visible to local people. Promotion of this event was literally everywhere – in Dubai airport, the streets, public transportation, on TV and radio stations, restaurants and so on. Due to such preparation work the event was classed as a total success, with large amounts of spectators and media present in all event locations. Add to this the great weather in the middle of December and you pretty much get an aviation paradise on earth! For us, WAG in Dubai will be an unforgettable and very pleasant memory and with such a successful event the UAE has raised the bar very high for the organisers of the next World Air Games. **RCMW**

**VIDEOS**

- OPENING CEREMONY:**  
[www.youtube.com/watch?v=05AUxjulec](http://www.youtube.com/watch?v=05AUxjulec)
- F3P AEROMODELLING:**  
[www.youtube.com/watch?v=C3DtLDvR0uY](http://www.youtube.com/watch?v=C3DtLDvR0uY)
- BREITLING WINGWALKER:**  
[www.youtube.com/watch?v=5HATisuNQ2U](http://www.youtube.com/watch?v=5HATisuNQ2U)
- POWERED AEROBATIC PILOT – AUDE LEMORDANT:**  
[www.youtube.com/watch?v=5HATisuNQ2U](http://www.youtube.com/watch?v=5HATisuNQ2U)
- AEROBATIC GLIDERS:**  
[www.youtube.com/watch?v=Q0vSIHrgcA8](http://www.youtube.com/watch?v=Q0vSIHrgcA8)
- PILOT CATCHERS:**  
[www.youtube.com/watch?v=W\\_7cUgc0hFQ](http://www.youtube.com/watch?v=W_7cUgc0hFQ)
- JETMAN DUBAI:**  
[www.youtube.com/watch?v=\\_VPvKl6ezyc](http://www.youtube.com/watch?v=_VPvKl6ezyc)
- C/L COMBAT & PYLON RACING ACTION, PLUS AL FURSAN JET TEAM:**  
[www.youtube.com/watch?v=avCFfStblg4](http://www.youtube.com/watch?v=avCFfStblg4)

**QR CODES**



WAG  
COMPETITION  
HIGHLIGHTS



DONATAS -  
ROUTINE A



DONATAS'  
WINNING  
FLIGHT



# The Sport Channel

A trip down memory lane with the Electraglide design and after last month's mention an aeromodelling legend gets in touch!

“There is nothing lost, that may be found, if sought...”  
(Edmund Spencer)



Gustave Rubitschka's rediscovery from the formative days of electric flight is the 'Electraglide 62'. Published in 1975, this compact motorglider was also admired by your author. Inset is the upgraded 'Electraglide 2' from the 1980s. See text

## This Month's Wise Words

Since mentioning the fact that I was finally getting a workshop organised a couple of very wise and supportive local modellers suggested that I might grasp the opportunity to build some projects that I 'never got around to', as frequently alluded here. I had to admit, I had no valid excuse. As long-serving readers know that particular list goes back a l-o-n-g way...

Back in the mid-1970s, I was making my first blundering experiments with electric power. I didn't fare too badly as I had the advantage of owning a Graupner 'Hi Fly', which was a decent power soarer with its geared power train and huge folding prop, all driven off seven x 1.2 Ah NiCad cells. I guess I was rather spoiled to own such a piece of state of the art technology and it served me well.

At the same time, I was interested in where electric power was going in relation to everyday sport flying and whether it would ever become a practical proposition for the likes of myself and my clubmates. By then I'd already become an avid consumer of American model magazines and could see the imaginative approaches that modellers and manufacturers were taking.

An email from correspondent Gustav Rubitschka in Vienna took me right back to one such design. I spotted this compact motor glider in RC Modeler magazine and was intrigued by its pert lines, looking a bit like a stretched cabin power model, with a dinky monowheel landing gear gear too!

Gustav wrote: "When, in August 1975, I saw Jim Zaremsky's plan of the 'Electraglide 62', I immediately wanted to

build one. That being the first electric plane with affordable equipment, but alas, still not within my budget. So, several years went by, and I recently found the plan online. This time, and with all the necessary equipment in my workshop, nothing was hindering me.

Span is 1500 mm, weight: 980 g, motor: Tumigy D2826/6, prop: KAVAN yellow 7/4, battery: 3S 2200, ESC: 40 A, power 200 W. How will it fly? We will see..."

Good luck with the test flights, Gustav. I've no doubt the Electraglide will have put in some serious flying by the time this appears in print. Another great design from electric flight's early days gets reinvigorated with 21st century tech.

A couple of years after I first saw the plan feature in RCM a new member joined our club and he actually had a copy of the plan – he'd taken the highly exotic route of ordering





The Electraglide 62 shows off its 'stretched cabin model' lines. Simple direct drive can motor/NiCad pack power train did the job back in the day. Inset: from even later, the much larger and even more refined 'Electraglide 3'

it direct from the States! A while later he gave me the plan and it's still in my collection somewhere.

Fast forward into the mid-80s and I discovered that designer Jim Zaremsky had published an updated version of the design, the 'Electraglide 2', which was further stretched to 72" span, with tip dihedral wings and slimmed and streamlined generally. Its sailplane credentials were further refined with the adoption of an Eppler 205 wing section.

I immediately wanted to build one. The finished model was a joy to fly. Fitted with a basic 540 can motor and running off a six-cell NiCad pack it gave good long flights and had the potential to soar. Motor control was via a simple push 'on'/push 'off' switch, triggered by a brief application of up elevator. Crude by today's standards but simple and effective.

The Electraglide 2 had a brief brush with public adulation when I flew it in public one summer at a major model show. Conditions were sunny, almost windless and our club's flying slot was set for midday when things were getting really hot.

I launched and potted around the circuit a couple of times. Then without warning, right over the flight line, the little Electraglide contacted a huge thermal. I cut the motor and rode out the lift, until the model was a tiny speck. Although I eventually steered it free of the thermal the model was not coming down in a hurry.

Embarrassingly, I had overrun the slot time and the next slot had to be delayed while the Electraglide made its leisurely way back to the field. But, commentator Dave Bishop made the flight into a minor event in its own right, marvelling at how it could perform so well.

When the Electraglide touched gently down on the strip, thirty minutes after its launch, the crowd (how many thousand was it?) erupted. It proved very popular, as punters were queuing up to ask questions about it.

In fact, it proved too popular, due to a slightly

warped prank by one of my clubmates. That weekend some of us had been selling off some airframes and there was no shortage of buyers. On the second day, I returned from a stroll around the trade stands to be greeted by my pal smirking and pointing to my star electric model.

While I was absent he'd stuck on a 'For Sale' label as a joke and a chap walked up and started waving cash around. Oh no, my favourite model! I was put on the spot but at that time I was also pragmatic

and mercenary. By the time the potential customer reappeared I'd taken out the radio gear and took the money. With insatiable modelling and musical habits, I couldn't say no. What would you have done?

Having been reintroduced to the Electraglides thanks to Gustav, I found that the family even grew to an Electraglide 3, which was slightly larger and used a geared motor. If anyone would like details of where to get plans for one or all three, just email me at the address at the end of this column.



While writing the about the era of NiCad power we heard from designer Sid King about his latest 'Novice', built from plans and bits from Colin Buckle. Turnigy 2822/14 1400KV, 2200 battery. All up weight 1 lb 11 oz, directly comparable to the diesel original. (The first electric Novice used 6 sub-C NiCads and weighed nearly 3 lb - it just about flew!)





World famous scale authority and all round modelling hero Dave Platt sent us these pics of part of his entry for Top Gun 2016. Large rubber scale Skyraider and 'Judy' were built for a new early morning F/F event at the comp



We saw Dan Mellor's 'Bonnacon' in its bare bones last time, seen here now with Dan's fine tissue covering and Tamiya acrylic paint finish. Great colour scheme as ever. By now its Irvine Mills .75 should be installed and it could be flying!

**Mail From 'Mr. Scale'**

Our references last time to R/C scale legend Dave Platt as designer of the enigmatic Keil Kraft 'Consort' and the single channel 'Half Tone' (as favoured by the Larne club in Northern Ireland) have now led to Dave himself making contact!

It's a great privilege to hear from such an iconic figure in our hobby. Nearly fifty years ago, Dave raised the bar in scale competition with the radical approach of 'adding realism' to scale subjects by simulating the appearance of operational wear and tear, weathering and even the 'optical perspective' effect of the atmosphere.

Dave boldly and rightly stated that without such treatment we create 'nice scale models' but nothing more. From today's standpoint we can see that Dave was introducing

Special Effects techniques into our hobby.

There can be few R/C modellers who haven't heard of the Top Gun scale comp in the USA, established by Frank Tiano and now into its 28th year. Dave Platt has been on board since its early days, producing outstanding entries every year.

When you read this, Top Gun 2016 will have come and gone. But Dave wanted to let us know about a special event year that reflects Top Gun's uniqueness and his own eclectic modelling interests.

Dave writes: "This year's Top Gun event in April will include a one shot, early morning, free flight rubber power scale category. The one and only rule is that wingspan must be 36" minimum (24" for biplanes). Meaning, a pretty good sized model, fully capable of fine flying performance."

The Top Gun contest, as you may know, is an invitation-only affair. Upon receiving an invitation I immediately set to work to produce an entry. I have been trimming out two models, a Douglas Skyraider and a Yokosuka 'Judy', and have a third completed but so far unflown. (Yes, I know – overachiever!)

A pleasure to hear from you, Dave and I hope Top Gun was a success – how could it not be? We look forward to hearing the results of the rubber scale comp too. Large rubber scale models are really something special and non-free flight modellers should just take a look at them in action and see the building and trimming skills involved. Try visiting YouTube and look at the many videos of entries at the Flying Aces Club's Nationals. Search for 'Geneseo FAC Nats' and be amazed.

**Expat Chief**

Another influential Brit modeller who moved to the USA was Bill Dean and we must thank the generation of 'Keil Kraft Kids' who wrote in about Alan Charlesworth's slope update of Bill's KK 'Chief' A/2 glider.

Having mentioned my own single channel Chief, my first radio model, a couple of readers asked if I was aware that after Bill Dean emigrated, he published a version of the Chief in a US magazine which included his own single channel R/C conversion.

I'd been unaware of this, but I was rather pleased to receive a scan of the plans in a follow-up email. If any former KK Kids or anyone else who thinks a Chief would be an essential addition to their fleet, send me an email at the address below asking for details.

**SC In Podcast Revelations Shock!**

A subject that has provided much amusement since it appeared here over a year ago is my musical background in the electro-pop world of the 1980s. Some readers actually bought the double vinyl album of our band's (Le LuLu's) work, being pressed in Germany. Greatly appreciated, guys.

Since then the album's initial pressing sold out. We heard subsequently that specialist collectors were snapping up copies and immediately re-selling them on auction sites at a vast profit. And do musicians benefit from all this frenzied commerce? What do you think?

Anyway, you might like this development. My friend and former band colleague, record producer Deni, has recently done an hour

long interview about her life and musical career on a US Internet radio station called 'Music Life Radio'. Not only is it fascinating to listen to, with some very funny and poignant stories, but your author gets a mention in it, in a sequence about how we first met. Type in the rather long link below (carefully!) and enjoy.

Contributions, please to The Sport Channel c/o the Traplet Publications address. All email correspondence to: gray\_rcmag@hotmail.com **RCMW**

**CONTACTS**

**MUSIC LIFE RADIO INTERVIEW**  
www.musicliferadio.com/2016/02/115-timecode-deni/



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## MAYFLY-6E

MW3789



Plan (MW3789) £11.99  
L.C Woodpack (WP3789) £35.00  
**FULL SET (SET3789) £42.29**

Designer: Chris Ward  
Wingspan: 36" / 915 mm  
Power Source: 2835 inrunner brushless motor

## FOURNIER RF5 (90")

MW2535



Plan (MW2535) £22.50  
L.C Woodpack (WP2535) £91.99  
ABS Cowl (CA2535CL) £18.50  
PETG Canopy (CA2535CY) £15.50  
**FULL SET (SET2535) £133.64**

Designer: Duncan Hutson  
Wingspan: 90" / 2285 mm  
Power Source: .30 - .40 2-stroke or .40 4-stroke

## MESSERSCHMITT ME163 KOMET (49.75")

MW3347



Plan (MW3347) £17.50  
L.C Woodpack (WP3347) £51.99  
FG Cowl (CF3347CL) £13.50  
Canopy (CA3347CY) £7.50  
**FULL SET (SET3347) £81.44**

Designer: Brian Taylor  
Wingspan: 49.75" / 1265 mm  
Power Source: .30 cu. in. 2-stroke

## MESSERSCHMITT BF109 (24")

MW3047



Plan (MW3047) £13.50  
L.C Woodpack (WP3047) £31.99  
**FULL SET (SET3047) £39.58**

Designer: Adrian Britton  
Wingspan: 24" / 610 mm  
Power Source: Speed 400

## MESSERSCHMITT BF110C (71")

MW3326



Plan (MW3326) £24.50  
L.C Woodpack (WP3326) £103.99  
Canopy (CA3326CY) £12.50  
Cowl Pair (CF3326CL) £36.50  
**FULL SET (SET3326) £159.74**

Designer: Brian Taylor  
Wingspan: 71" / 1803 mm  
Power Source: Two .30-.40 cu. in. two-stroke

## RED RAW

MW3412



Plan (MW3412) £18.50  
L.C Woodpack (WP3412) £49.99  
**FULL SET (SET3412) £60.28**

Designer: Mike Freeman  
Wingspan: 63"  
Power Source: Mega 22/20/3E brushless or similar

## DH 87B HORNET MOTH

MW3555



Plan (MW3555) £14.50  
L.C Woodpack (WP3555) £62.99  
**FULL SET (SET3555) £68.38**

Designer: Ian Easton  
Wingspan: 38.25" / 975 mm  
Power Source: 2212/13 brushless outrunner 25A ESC

## DH83 FOX MOTH

MW3643



Plan (MW3643) £22.50  
L.C Woodpack (WP3643) £90.99  
**FULL SET (SET3643) £100.78**

Designer: Robin Fowler  
Wingspan: 76" / 1930 mm  
Power Source: XYH4-502 600KV 43A Brushless Outrunner

## DH82A TIGER MOTH (66")

MW3460



Plan (MW3460) £27.50  
L.C Woodpack (WP3460) £101.99

ABS Tank/Seats/Wheel Covers/Step/Oil Tank (CA3460AUX) £12.50  
Clear Instrument panels (x2) (CA3460MNT) £6.50  
Clear Screens (CA3460CY) £6.50  
Cowl Bowl (CF3460CL) £14.50  
Tank (CF3460TK) £30.50  
**FULL SET (SET3460) £179.99**

Designer: Dennis Bryant  
Wingspan: 66" / 1677 mm  
Power Source: .60 to .80 cu. in.

## FOKKER D.VIII

MW3599



Plan (MW3599) £22.50  
L.C Woodpack (WP3599) £52.99  
**FULL SET (SET3599) £66.58**

Designer: Peter Miller  
Wingspan: 54" / 1372 mm  
Power Source: .25 cu.in. two-stroke; .30 4-stroke

## SLINGSBY T-21

MW2706



Plan (MW2706) £24.50  
L.C Woodpack (WP2706) £188.99  
**FULL SET (SET2706) £190.78**

Designer: Chris Williams  
Wingspan: 163.375" / 4115 mm

## MINIMOA (191")

MW2665



Plan (MW2665) £23.50  
L.C Woodpack (WP2665) £147.99  
**FULL SET (SET2665) £152.98**

Designer: Chris Williams  
Wingspan: 191" / 4850 mm

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### DH110 SEA VIXEN

MW3430



Plan (MW3430) £22.50  
 L.C Woodpack (WP3430) £18.99  
**FULL SET (SET3430) £35.27**

Designer: Chris Golds  
 Wingspan: 29"  
 Power Source: Two brushless motors and Derek Knight 32 mm fans

### WATTS UP (100")

MW3396



Plan (MW3398) £17.50  
 L.C Woodpack (WP3398) £58.99  
**FULL SET (SET3398) £68.84**

Designers: Brian Austin and Ray Pavely  
 Wingspan: 100" / 2.54 m  
 Power Source: Mega 22/20/3E

### FIELDFARE

MW3511



Plan (MW3511) £14.50  
 L.C Woodpack (WP3511) £53.99  
 Canopy (CA3511CY) £6.50  
**FULL SET (SET3511) £65.67**

Designer: Sid King  
 Wingspan: 72" / 1830 mm  
 Power Source: A2212-10T 1400 rpm/V (140 Watt) or similar 20A ESC

### SCHEMP-HIRTH STANDARD CIRRUS

MW2204



Plan (MW2204) £22.50  
 L.C Woodpack (WP2204) £91.99  
 Canopy (CA2204CY) £6.50  
**FULL SET (SET2204) £107.07**

Designer: Mike Trew  
 Wingspan: 118" / 3000 mm

### FIESELER FI-156 STORCH (93")

MW3466



Plan (MW3466) £32.50  
 L.C Woodpack (WP3466) £108.99  
 FG Cowl (CF3466CL) £35.50  
**FULL SET (SET3466) £159.29**

Designer: Dennis Bryant  
 Wingspan: 93" / 2362 mm  
 Power Source: .60 4-stroke; .90 4-stroke

### WESTLAND LYSANDER (81")

MW3448



Plan (MW3448) £32.50  
 L.C Woodpack (WP3448) £103.99  
**FULL SET (SET3448) £121.48**

Designer: Dennis Bryant  
 Wingspan: 81" / 2057 mm  
 Power Source: .60 to .90 cu. in. 2-strokes; .90+ 4-strokes

### N.A. T-6 TEXAN/HARVARD (94.25")

MW3336



Plan (MW3336) £27.50  
 L.C Woodpack (WP3336) £118.99

Cowl (CF3336CL) £35.50  
 Canopy 2 pc (CA3336CY) £19.50  
 FG Undercarriage Fairing (CF3336FG) £18.50  
 Flanged Prop Nut (Large) (CD3336SF) £7.50  
 'Full Size Focus' Photo CD (FF20) £4.99  
**FULL SET (SET3336) £209.23**

Designer: Brian Taylor  
 Wingspan: 94.5" / 2.425 m  
 Power Source: 1.20 to 1.50 cu. in. 4-stroke

### NORTH AMERICAN AT-6 TEXAN/HARVARD (68.5")

MW3352



Plan (MW3352) £20.50  
 L.C Woodpack (WP3352) £73.99  
 FG Cowl (CF3352CL) £23.50  
 Canopy (CA3352CY) £12.50  
 Flanged Prop nut (Small) (CD3352SP) £7.00  
**FULL SET (SET3352) £118.29**

Designer: Brian Taylor Wingspan: 68.5" / 1740 mm  
 Power Source: .45 to .60 cu. in. 2-stroke

### HAWKER FURY (60")

MW3453



Plan (MW3453) £27.50  
 L.C Woodpack (WP3453) £133.99  
 Aluminium Spinner Set (CS3453SET) £22.99  
 Cowl (CF3453CL) £21.50  
**FULL SET (SET3453) £185.38**

Designer: Dennis Bryant  
 Wingspan: 60" / 1542 mm  
 Power Source: .60 cu. in. 2-stroke

### HAWKER HURRICANE MK.1 (70")

MW3333



Plan (MW3333) £22.50  
 L.C Woodpack (WP3333) £81.99  
 PETG Canopy (CA3333CY) £7.50  
 FG Cowl (CA3333CL) £24.50  
 Aluminium Spinner set (CS3333SET) £22.99  
**FULL SET (SET3333) £134.62**

Designer: Brian Taylor Wingspan: 70" / 1780 mm  
 Power Source: .75 - .80 cu. in. 4-stroke or .60 cu. in. 2-stroke

### SUPERMARINE SPITFIRE MK.XIV & XIX (69")

MW3342



Plan (MW3342) £23.50  
 L.C Woodpack (WP3342) £118.99  
 Aluminium Spinner Set (CS3342SET) £24.99  
 Canopy Mk.XIX (14") (CA3342CY-A) £7.50  
 Canopy Mk.XIX (19") (CA3342CY-B) £6.50  
 FG Cowl (CF3342CL) £40.50  
 FG Carburettor Intake (CF3342RAD) £13.50  
**FULL SET (SET3342) £211.93**

Designer: Brian Taylor Wingspan: 69" / 1753 mm  
 Power Source: .60 cu. in. 2-stroke or suitable 4-stroke

### CHANCE-VOUGHT F4U-1 CORSAIR (61.5")

MW3349



Plan (MW3349) £20.50  
 L.C Woodpack (WP3349) £58.99  
 FG Cowl (CF3349CL) £23.50  
 Canopy (CA3349CY) £7.50  
 Domed Prop Nut-pip (Small) (CD3349SP) £12.50  
**FULL SET (SET3349) £110.69**

Designer: Brian Taylor Wingspan: 61.5" / 1562 mm  
 Power Source: .60 cu. in. 2-stroke (or equivalent 4-stroke)

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## CHANCE-VOUGHT F4U-1 CORSAIR (82")

MW3338



Plan (MW3338) £27.50  
 L.C Woodpack (WP3338) £108.99  
 Cowl (CF3338CL) £44.50  
 Canopy (CA3338CY) £13.50  
 FG Wing Crank Fairings (PR) (CF3338FG) £23.50  
 Domed Prop Nut-Pip (large) (CD3338SP) £16.00  
**FULL SET (SET3338) £197.89**

Designer: Brian Taylor  
 Wingspan: 82" / 2.082 m  
 Power Source: 1.50 cu. in. 4-stroke

## KAWANISHI N1K2-JA SHIDEN KAI 'GEORGE' (64")

MW3330



Plan (MW3330) £22.50  
 L.C Woodpack (WP3330) £108.99  
 Canopy (CA3330CY) £12.50  
 Cowl (CF3330CL) £33.50  
**FULL SET (SET3330) £159.74**

Designer: Brian Taylor  
 Wingspan: 64" / 1.620 mm  
 Power Source: 60 cu. in. 2-stroke

## DH98 MOSQUITO FB.VI (71")

MW3345



Plan (MW3345) £24.50  
 L.C Woodpack (WP3345) £58.99  
 Aluminium (Single) Spinner Set (CS3345SET) £22.99  
 Canopy (CA3345CY) £12.50  
 FG Cowl (CF3345CL) £65.50  
 FG Undercarriage Door (4pc) (CF3345UC) £17.50  
**FULL SET (SET3345) £179.05**

Designer: Brian Taylor Wingspan: 71" / 1.830 mm  
 Power Source: Two .25 - .40 cu. in. 2-stroke (equivalent 4-stroke)

## HAWKER TYPHOON 1B (72.75")

MW3339



Plan (MW3339) £22.50  
 L.C Woodpack (WP3339) £108.99  
 Canopy (CA3339CY) £12.50  
 FG Cowl (CF3339CL) £43.50  
 Aluminium Spinner Set (CS3339SET) £22.99  
**FULL SET (SET3339) £189.43**

Designer: Brian Taylor  
 Wingspan: 72.75" / 1.848 mm  
 Power Source: 90 to 1.20 cu. in. 4-stroke

## SUPERMARINE SPITFIRE MK.VIII & IX (83")

MW3337



Plan (MW3337) £27.50  
 L.C Woodpack (WP3337) £189.99  
 Canopy (CA3337CY) £7.50  
 FG Cowl (CF3337CL) £43.50  
 Aluminium Spinner set (CS3337SET) £22.99  
 FG Carburettor intake (CF3337RAD) £16.50  
**FULL SET (SET3337) £277.18**

Designer: Brian Taylor Wingspan: 83" / 2.108 m  
 Power Source: 1.50 cu. in. 4-stroke

## RAZOR 90

MW3636



Plan (MW3636) £18.50  
 L.C Woodpack (WP3636) £80.99  
 Canopy (CA3636CY) £9.50  
 ABS Air Intakes (CA3636INT) £17.50  
**FULL SET (SET3636) £113.84**

Designer: Shane Harding Wingspan: 50" (1270mm)  
 Power Source: Hacker B50 and Wemotec 90mm Fans Units or similar

## MIRAGE 2000B

MW3667



Plan (MW3667) £22.50  
 L.C Woodpack (WP3667) £90.99  
 Canopy (CA3667CY) £22.50  
**FULL SET (SET3667) £122.39**

Designer: Philip Noel  
 Wingspan: 39" (990mm)  
 Power Source: Wren MW44 or 54 Gas turbine Turbine

## DH110 SEA VIXEN

MW3659



Plan (MW3659) £22.50  
 L.C Woodpack (WP3659) £87.99  
 Canopy (CA3659CY) £11.50  
**FULL SET (SET3659) £109.79**

Designer: Philip Noel  
 Wingspan: 50" (1270 mm)  
 Power Source: 2 x Airpower/ Wemotec 70mm fan units

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### Strip Wood - Pack B

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  - 10 x 3/16" (5 mm)
  - 10 x 3/32" (2.4 mm)
  - 6 x 1/8"x1/4" (3.2x6.5 mm)
  - 10 x Spruce...
- Rrp £17.82 + p&p/s&h**

### Strip Wood - Pack C

- 14 x 1/8" (3.2 mm)
  - 14 x 1/8" (3.2 mm)
  - 14 x 3/16" (5 mm)
  - 14 x 3/32" (2.4 mm)
  - 10 x 1/8"x1/4" (3.2x6.5 mm)
  - 15 x Spruce...
- Rrp £26.65 + p&p/s&h**

### Strip Wood - Pack D

- 14 x 1/8" (3.2 mm)
  - 14 x 1/8" (3.2 mm)
  - 20 x 3/16" (5 mm)
  - 20 x 3/32" (2.4 mm)
  - 20 x 1/8"x1/4" (3.2x6.5 mm)
- Rrp £21.62 + p&p/s&h**

### Sheet Wood - Pack A

- 2 x 1/8" (3.2 mm)
  - 2 x 3/16" (2.4 mm)
  - 2 x 3/16" (5 mm)
  - 5 x 1/16" (1.6 mm)
  - 1 x 1/4" (6.5 mm)
- RRP £21.13 + p&p/s&h**

### Sheet Wood - Pack B

- 3 x 1/8" (3.2 mm)
  - 4 x 3/32" (2.4 mm)
  - 4 x 3/16" (5 mm)
  - 8 x 1/16"x1/4" (1.6 mm)
  - 2 x 1/4" (6.5 mm)
- RRP £37.51 + p&p/s&h**

### Sheet Wood - Pack C

- 6 x 1/8" (3.2 mm)
  - 6 x 3/32" (2.4 mm)
  - 6 x 3/16" (5 mm)
  - 10 x 1/16" (1.6 mm)
  - 4 x 1/4" (6.5 mm)
- RRP £50.56 + p&p/s&h**

### Sheet Wood - Pack D

- 10 x 1/8" (3.2 mm)
  - 10 x 3/32" (2.4 mm)
  - 10 x 3/16" (5 mm)
  - 14 x 1/16" (1.6 mm)
  - 6 x 1/4" (6.5 mm)
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# Diary Dates

## INDOOR

### 31st May, 28th Jun '16

**Indoor R/C Small Models Meets**, in the Main Hall at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. All meetings will run from 7.00 pm to 9.30 pm. Models to be flown at these meetings are to be limited to a maximum weight of 95 grams (3.5 ounces) for fixed wing aircraft, in flight trim, including battery (not to exceed a 2-cell LiPo pack). Helicopters are to be limited to a rotor diameter of 12" (305 mm). All models will be weighed before flight, and will be judged on their suitability for the venue on the evening. Admission to the meetings will be £4 for flyers and £1 for spectators. Flyers will be required to show proof of insurance. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. (Tel. 01489 895157) or see our website: [www.wcaero.co.uk](http://www.wcaero.co.uk)

### 4th June 2nd Jul, 1st Oct, 5th Nov, 3rd Dec '16

**Fun Flying at Potters Bar**, at Furze Field Sports Centre, Mutton Lane, Potters Bar, Herts. EN6 3BW. From 6 pm until 10 pm, flyers £9, spectators £2. Small rubber free flight and small electric models, wingspan will be limited to 20". All enquiries to Mike Quille, Tel: 020 8500 3549, Email: [mp.quille@live.co.uk](mailto:mp.quille@live.co.uk)

### 8th Oct, 12th Nov, 10th Dec '16

**North London MFC Indoor R/C Meetings**, at Furze Field Sports Centre, Potters Bar, Herts. EN6 3BW (Junction 24/M25), 6 pm – 10 pm. All up weight limit for fixed wing 225 g, 36 inch span, Helicopters 400 g. BMFA insurance required. Admission: flyers £9, spectators £2.50. For more information contact Peter Elliott on 01707 336982

## GENERAL

### 21st & 22nd May '16

**PSSA 'Fly for Fun'**, The Blwch, Bridgend, South Wales. Meet at the 'Ice-Cream' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Steve Houghton on 07762 256126 or Email: [Steve.houghton59@gmail.com](mailto:Steve.houghton59@gmail.com) Further information at [a470soaring.blogspot.co.uk](http://a470soaring.blogspot.co.uk)

### 21st & 22nd May '16

**LMA Swapmeet**, at the Tibenham model event, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883, Email: [topgun@modelpilot.co.uk](mailto:topgun@modelpilot.co.uk)

### 21st & 22nd May '16

**IMAC UK Competition**, at Cashmoor, Dorset. Point of contact for information etc. is Mal Green at [mcgreen65@hotmail.com](mailto:mcgreen65@hotmail.com)

### 22nd May '16

**GBR/CAA F3A League competition**, Deeside. All schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Brian Hoare on 07962 358470 for details

### 22nd May '16

**White Sheet Scale Fly-In**, to be held at the White Sheet Club slopes near Mere, Somerset (back up date 5th June). No competition, just a friendly fly-in. Proof of insurance, please. Further information from [c\\_williams30@sky.com](mailto:c_williams30@sky.com). Go-No-Go decision the evening before on the WS and SSUK forums [www.whitesheet.org.uk](http://www.whitesheet.org.uk), [scalesoaring.co.uk](http://scalesoaring.co.uk)

### 28th & 29th May '16

**F3A World Cup League Event**, Criterium International du Hainaut Grandrieu, Belgium. Please contact Ashley Hoyland on 0114 2873432 for details

### 3rd Jun '16

**Bretons MFC Swap 'N' Meet, first Swap 'n' Meet Social Evening at the Bretons Community Hall**, Rainham Road, Rainham Essex RM13 7LP. From 7 pm till 10 pm. Emphasis is on the meet and socialising for this new event in the modellers' calendar. Come along, relax and meet fellow model flyers from across the county. There will be no commission taken or booking fees. Light refreshments will be available; Tea/Coffee and BBQ (weather permitting). Entry £2.00. Table space for sellers is allocated on a first come basis. Contact: [info@bretonsmfc.org.uk](mailto:info@bretonsmfc.org.uk)

### 4th Jun, 2nd Jul, 6th Aug, 3rd Sep, 1st Oct, 5th Nov, 3rd Dec '16

**Wessex Soaring Association Fly-Ins**, held on the first Saturday or Sunday of the month, depending on the forecast. Slopes located in South Wiltshire, approx 10 miles west of Salisbury. All welcome. Contact Pete Carpenter on 07919 903742 or [pete.carpenter@yahoo.co.uk](mailto:pete.carpenter@yahoo.co.uk) for details

### 5th Jun '16

**F3A. 3rd BMFA GBR Team Selection Event**, Ashbourne, Derbyshire. FAI 'P' and 'F' schedules. Also GBR/CAA League competition, all schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome, please contact Contest Director, Adrian Harrison on 07976 244004 for details

### 5th Jun '16

**North London MFC Scale Day**, at Warren Lane, Baldock, Herts SG7 6RR. Flying from 10 am. BBQ and drinks available. All pilots need BMFAA certificate or LMA proficiency, those flying >7 kg models need BMFA B certificate or LMA proficiency. Proof of insurance required. No noisy models please. £5 pilots entry fee. Contact Maurice Northcott on 07866 105721 or Email: [mail@mpnltd.fsnet.co.uk](mailto:mail@mpnltd.fsnet.co.uk)

### 5th Jun '16

**PANDAS Fifth Single Channel & Retro R/C Fly-In**, hosted by the Pontefract and District Aeromodellers Society at Pontefract Park, located in the southwest corner of junction 32 of the M62. Access is via a huge white gate, 1/4 mile south towards Pontefract. Please refer to the map provided on [www.pandasero.co.uk](http://www.pandasero.co.uk) and for sat nav the nearest postcode is WF8 4QD. The main objective is to get everyone interested in retro R/C flying together for equal amounts of banter, burgers and button-bashing! For eligibility information etc. please check out the PANDAS website, along with details of themed sessions. Updates and further information will be posted on [www.pandasero.co.uk](http://www.pandasero.co.uk) and [www.singlechannel.co.uk](http://www.singlechannel.co.uk)

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### 10th, 11th & 12th Jun '16

**UK F3A World Cup League Event**, Near Ashford, Kent. International entry. Visitors welcome. See [www.gbrcaa.org/WorldCup/](http://www.gbrcaa.org/WorldCup/) or contact Contest Director Matt Hoyland on 07739 840498 or Ashley Hoyland on 0114 2873432 for more details

### 11th & 12th Jun '16

**PSSA Fly-In and Clwyd SA Ray Jones Memorial PSS event**, The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: [webmaster@pssaonline.co.uk](mailto:webmaster@pssaonline.co.uk) More details for Sunday's memorial event on the CSA website or Email: Matt Jones at [mattjonesgte88@hotmail.co.uk](mailto:mattjonesgte88@hotmail.co.uk)

### 11th & 12th Jun '16

**Opale Fest V2**, at Cessieu, Rhone-Alpes, France. 10 am – 4 pm. For all things R/C paragliding, learn from experienced pilots, get tips and tricks, and gather knowledge and experience from the experts. Paramotor, Soaring, Towing, Pylon Race, Paraglider Speedrace, FPV flights, competitions and night flying are planned. More details to come. Further info check out [www.opale-paramodels.com](http://www.opale-paramodels.com)

### 17th to 19th Jun '16

**Weston Park International Model Air Show**, at Weston Park, Weston-under-Lizard, Nr. Shifnal, Shropshire TF11 8LE. Celebrating their 25th anniversary the show starts at 10 am (gates open at 8 am), includes model aircraft displays, on road and circuit model car racing, full size displays, model boats, Quad Fair helifest. On-site camping available. Adults £12, Children £6, Family £28. For more information check out [www.westonparkmodelairshow.co.uk](http://www.westonparkmodelairshow.co.uk) Tel: 01952 587298, Mobile 07758 895068

### 17th, 18th & 19th Jun '16

**F3A World Cup League Event**, France. Please contact Ashley Hoyland on 0114 2873432 for details

### 18th & 19th Jun '16

**IMAC UK Competition**, Wrexham, Flintshire, Wales. Point of contact for information etc. is Mal Green at [mcgreen65@hotmail.com](mailto:mcgreen65@hotmail.com)

### 18th & 19th Jun '16

**Airborne At The Sumners Ponds Model Show**, is now in its fourth year in the lovely surroundings that make up the Sumners Ponds Fishery and Campsite in Barns Green, Horsham, West Sussex. Last year the show attracted over 2000 visitors. New for 2016, FPV Quad Racing will have its own flying field adjacent to the main flight line, as demand has been so high. And there will also be an area put aside for Control Line flying. The main flight line will once again cater for helicopters and aeroplanes. Camping is available on site and is free to all pilots on Friday and Saturday evenings. If you wish to participate please contact Peter Glover (07954 370936) or see the show's Facebook and web pages at: [www.facebook.com/airborne.sumnersponds](http://www.facebook.com/airborne.sumnersponds) [www.sumnersponds.co.uk](http://www.sumnersponds.co.uk)

### 19th Jun '16

**Salisbury Model Flying Club Midsummer Fly-In**, open to all clubs, for more information check out [www.salisburymodelflyingclub.co.uk](http://www.salisburymodelflyingclub.co.uk), or email: [spikespencer707@btinternet.com](mailto:spikespencer707@btinternet.com)



**25th & 26th Jun '16**

**F3A World Cup League Event**, Netherlands. Please contact Ashley Hoyland on 0114 2873432 for details

**25th & 26th Jun '16**

**30th Wings & Wheels Model Spectacular**, at North Weald Airfield, Epping, Essex CM16 6AR. 9.30 am – 5.30 pm. R/C displays of all kinds, trade, Bring & Buy, Boat Pool and lots more. Weekend camping. All enquiries: Email: admin@wingsnwheels.net or Tel: 01242 604126, www.wingsnwheels.net

**2nd & 3rd Jul '16**

**Woodspring Wings Annual Model Flying Show**, hosted by Woodspring Wings MAC at its airfield on Claverham Drove, North of Yatton. Access from the M5 will be well signposted and parking is free. Includes continuous displays by experienced international show pilots, flying single and multi-engine aircraft models depicting aviation throughout the years from early biplanes to modern jet fighters with gas turbine engines. The show is complemented by static displays and trade marquees that have been well received and enjoyed by thousands of visitors since the inaugural show in the early 1990s. The club will be running its popular raffle, with cash prizes for the winners to be drawn on Sunday. A food court provides sustenance throughout the day so lunch out is no problem and a bar conveniently situated near the displays offers West Country ciders and beers to enjoy. An extensive grassed area has wide views of the displays and an opportunity to sit and relax. Further details at [www.woodspringshow.co.uk](http://www.woodspringshow.co.uk)

**2nd Jul '16**

**GBR/CAA F3A League competition**, Skelbrooke. All schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Bob Rowland on 07969 456441 for details

**3rd July '16**

**White Sheet Scale Fly-In**, to be held at the White Sheet Club slopes near Mere, Somerset (back up date 17th July). No competition, just a friendly fly-in. Proof of insurance, please. Further information from: [c\\_williams30@sky.com](mailto:c_williams30@sky.com). Go-No-Go decision the evening before on the WS and SSUK forums [www.whitesheet.org.uk](http://www.whitesheet.org.uk), [scalesoaring.co.uk](http://scalesoaring.co.uk)

**9th & 10th Jul '16**

**IMAC UK Competition**, Rhyl, North Wales. Point of contact for information etc. is Mal Green at [mgreen65@hotmail.com](mailto:mgreen65@hotmail.com)

**10th Jul '16**

**F3A. 4th BMFA GBR Team Selection Event**, Oxford. FAI 'P' and 'F' schedules. Also GBR/CAA League competition, all schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Peter Brett on 07795 061145 for details

**10th Jul '16**

**North London MFC Glider Day**, at Warren Lane, Baldock, Herts SG7 6RR. Flying from 10 am. BBQ and drinks available. All pilots need BMFA A certificate or LMA proficiency. Proof of insurance required. No noisy models please. £5 pilots entry fee. Contact Maurice Northcott on 07866 105721 or Email: [mail@mpnlt.d.fsnet.co.uk](mailto:mail@mpnlt.d.fsnet.co.uk)

**16th & 17th Jul '16**

**LMA Swap Meet**, at the Cosford show, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883, Email: [topgun@modelpilot.co.uk](mailto:topgun@modelpilot.co.uk)

**17th Jul '16**

**GBR/CAA F3A League competition**, Grimsby. All schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Dave Tofton on 07809 490847 for details

**24th Jul '16**

**GBR/CAA F3A League competition**, Mansfield. All schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Stuart Mellor on 01246 568043 for details

**31st Jul '16**

**GBR/CAA F3A League competition**, Warboys. All schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Clive Whitwood on 01487 832195 for details

**31st Jul '16**

**Bath SPARCS All Electric Fly-In**, at RAF Colerne Wiltshire. Airfield site with grass and tarmac runways. Proof of BMFA insurance required. Regret no facilities for spectators. Pilots briefing at 10 am. Contact: Bob Partington 01225 891441, Email: [grpartington@gmail.com](mailto:grpartington@gmail.com)

**28th Jul to 6th Aug 2016**

**F3A European Championships**, Untermünkheim – Germany. See [www.ec-f3a-2016.de/](http://www.ec-f3a-2016.de/) If you need more details contact Ashley Hoyland on 0114 2873432

**6th & 7th Aug '16**

**Redruth & District Model Flying Club 25th Annual Summer Show**, 10 am to 5 pm, both days, along with our club pilots there will be again a number of local club pilots and guests, a small number of trade stands, and we can cater for a small number of campers wishing to make a week or weekend holidaying visit. There will be barbecue catering on site. Modellers wishing to fly at the show, contact Steve for available forms and to download attachment. Contacts: Steve Polkinghorne 01209313263, or Email: [stevewings55@tiscali.co.uk](mailto:stevewings55@tiscali.co.uk) Alan Greenfield on 07706 929494, or check out the the club website on [www.rdmfc.co.uk](http://www.rdmfc.co.uk)

**7th Aug '16**

**Traplet Flying Only Scale Round 2**, at **Bickershaw MFC**, Lancashire, WN2 5TD. 10 am – 5 pm. Sponsored with prizes by Traplet. The only requirement is that the plane is a recognisable version of a full size fixed-wing aircraft. There is no builder of the model rule so ARTF's and ready-made models can be used. Pilots of models weighing over 7 kg need a 'B' certificate to fly. Flying schedules and further information from Peter Maw at: [secretary@bickershawmfc.co.uk](mailto:secretary@bickershawmfc.co.uk)

**13th & 14th Aug '16**

**PSSA 'Fly for Fun' event with the Lleyn MAC**, Nr Abersoch, North Wales. Meet at the Londis car park in Llanbedrog for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: [webmaster@pssaonline.co.uk](mailto:webmaster@pssaonline.co.uk)

**13th & 14th Aug '16**

**LMA Swap Meet**, at the Elvington show, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883, Email: [topgun@modelpilot.co.uk](mailto:topgun@modelpilot.co.uk)

**13th & 14th Aug '16**

**IMAC UK Competition Dates**, Clitheroe, Lancashire. Point of contact for information etc. is Mal Green at [mgreen65@hotmail.com](mailto:mgreen65@hotmail.com)

**14th Aug '16**

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

**21st Aug '16**

**Deeside M.A.C. Open Event**, Broken Bank flying site off the A548 Flintshire. Start time 9 am. All flyers must be B.M.F.A. members be insured with proof of insurance. Max weight of models 30 kg. Models over 20 kg to have C.A.A./L.M.A certification. Models over 7 kg will require a B certificate. The event is a family fun day for the following classes: Fixed wing, I.C./Electric, Turbine. Helicopter, IC/Electric, Turbine. On site, Toilet, Barbeque and a 230 V Ac charging facility, and the site has a take-off strip suitable for large models. The gates will be open from 8.30 am and locked at 10.30 am, however a phone number will be displayed on the gate for latecomers. Contact: George Robson for further information and directions. Email: [zen219506@zen.co.uk](mailto:zen219506@zen.co.uk), Tel: 01352761814 or check out the website at [www.deesidemac.co.uk](http://www.deesidemac.co.uk)

**3rd & 4th Sep '16**

**LMA Swap Meet**, at the Much Marcle show, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883, Email: [topgun@modelpilot.co.uk](mailto:topgun@modelpilot.co.uk)

**4th Sep '16**

**GBR/CAA F3A League competition**, Grimsby. All schedules. See [gbrcaa.org](http://gbrcaa.org) – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Dave Tofton on 07890 490847 for details

**4th Sep '16**

**Salisbury Model Flying Club Scale Day**, open to all clubs, for more information check out [www.salisburymodelflyingclub.co.uk](http://www.salisburymodelflyingclub.co.uk) or email: [spikespencer707@btinternet.com](mailto:spikespencer707@btinternet.com)

**4th Sep '16**

**White Sheet Scale Fly-In**, to be held at the White Sheet Club slopes near Mere, Somerset (back up date 18th Sept). No competition, just a friendly fly-in. Proof of insurance, please. Further information from: [c\\_williams30@sky.com](mailto:c_williams30@sky.com). Go-No-Go decision the evening before on the WS and SSUK forums, [www.whitesheet.org.uk](http://www.whitesheet.org.uk), [scalesoaring.co.uk](http://scalesoaring.co.uk)

**9th to 11th Sep '16**

**F3A Triple Crown Invitational team competition**: England, Ireland, Scotland. Venue Enniscorthy, Co Wexford, Ireland. Visitors welcome but please contact Competition Secretary, Adrian Harrison on 07976 244004 for details

**10th & 11th Sep '16**

**PSSA 'A-4 Skyhawk Mass Build' Fly-In event**, The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: [webmaster@pssaonline.co.uk](mailto:webmaster@pssaonline.co.uk)

**10th & 11th Sep '16**

**Southern Model Arts & Crafts Show**, at Headcorn Aerodrome, Kent. will feature a stunning array of model aircraft, helicopters, ships, tank and other vehicles. A full range of other activities, including the popular Bring & Buy stand, and a showground packed with traders makes this a must visit event for anyone with an interest in this fascinating hobby whether a professional or a beginner. Entry: £12 adult, £10 child, under 5's Free, family (2 adults, 2 children) £35. For more details check out the website at [www.headcornevents.co.uk](http://www.headcornevents.co.uk)



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Frank Skilbeck relates the build of a new aerotow tug for the Newent & District Model Aircraft Club. The club's new V-tailed tug is based on Keith Humber's Towrag biplane, originally designed some 25 years ago for a .90 size four-stroke and capable of towing up 100 inch thermal soarers. Frank updated the distinctive design to electric power, using 8S (2 x 4S in series) 5,000 mAh LiPos. The resultant performance boost is ideal for the 3 to 4 m scale gliders that club members like to tow.

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### Electronic Speed Controllers Explained



The ESC is an essential part of any electric power system and knowing how to select and set one up can be confusing, especially for novice R/C pilots. Electric flight enthusiast Brian Collins offers a beginners' guide to choosing, fitting and operating the right ESC for your latest model.

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