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Contents

DECEMBER 2016 • ISSUE #395

FRONT COVER

The Large Model Association's big rally is held at RAF Cosford in July each year. As usual our intrepid LMA reporter Neil Hutchinson was stationed on the flight line with his long lens to capture some of the in-flight action from the stunning array of large model aircraft flown at the show. Here he has captured another superb model built by Steve Rickett, the Miles M39b experimental aircraft

REGULARS

REVIEWS

FEATURES

Pre-flight

Kevin Crozier
Editor | Radio Control Model World
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Malvern WR13 6NN. UK
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Welcome to the December issue of RC Model World.

Gosh, another year gone already. Don't worry, I won't go all Christmassy on you; as I write this introduction in October it will be a while yet before any of us start feeling festive – unless you work on the High Street that is!

Instead, this month I want to take the opportunity to give model club PRO's, event organisers and UK model trade marketeers a bit of a gentle kick up the rear. Here at RC Model World we offer two free opportunities each month to spread the word about modelling events and new R/C model products to our many thousands of readers. Regular readers will know that these columns are called Diary Dates and Shop Window, the former being an event listing and the latter a chance for the model trade to send short press releases about any new products that they wish to promote.

Sadly, both have been 'withering on the vine' a bit lately and they are in danger of being cut by yours truly unless those aforementioned PRO's, event organisers and UK based model traders make much better use of these regular features. Ironically, we still get quite a lot of press releases from continental model companies, so it's a bit of a mystery why the British model trade does not make much better use of the free service that we provide. A few UK companies do still send regular press release, but there are many that do not.

Unfortunately there is a tendency these days to think that all promotion can be done on websites and social media. There's nothing wrong at all with using these modern methods of communication but printed media still has a strong following, especially amongst the, shall we say, more senior age groups who make up the mainstream of the R/C model flying hobby. And the daft thing is that if you've gone to the trouble of writing a short piece about an event or a product to place on a website, then it's just a small step to copy it to an email and to fire it off to the editorial office here at Traplet. So please let's be having more Diary Dates and Shop Window entries. Please send them to: rcmw@traplet.com

OK, I've tucked my soapbox away now, so let's take a look at what's in store for you in this, our end of year magazine. The recent Scale World Championships in Romania are the focus of a couple of articles, the first being Neil Tidey's personal recollections from inside the GB scale team. And Dave Goodenough finds out what makes a top scale modeller tick, as he talks to the new F4H World Champion, Daniel Boulanger.

Keeping it scale, we conclude Laddie Mikulasko's plan feature for the Thurston Teal floatplane and take the opportunity to introduce our latest free pull-out plan for a 37-inch span Andreasson BA-4B biplane, designed by Roger Vaughn. Things get sporty with this month's Feature Plan, which is dedicated to Stella Clipper, a 1.5 metre class 'hotliner' designed by Brian Austin for four function R/C and an 480KV outrunner.

With the nights drawing in fast, we test the FMS Firefly, a brightly lit 3S night flyer. Why stop evening flying just because it's winter!

In other articles we have coverage from the LMA's big event at RAF Cosford, as well as a taste of the new Midland's model show at Ragley Hall, and we catch up on competition aerobatics as Keith Jackson returns to report from the F3A Nationals. David James gets to fly with his simulated contra-rotating prop, Greg Thompson writes on R/C combat down under and Chris Williams and Mike Proctor provide updates on R/C scale gliding and thermal soaring respectively.

So fetch a cuppa and settle down for a good read. Until next time...

Happy flying!

Kevin

CHECK OUT PAGE 14 FOR OUR LATEST SUBSCRIPTION DEALS

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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

BMFA National Flying Site And Visitor Centre

As reported in the October issue of RCMW, work is progressing on the BMFA National Flying Site and Visitor Centre. Manny Williamson, Development Officer of the British Model Flying Association, promised to keep us updated on progress and here is the latest news on this exciting venture:

"As previously reported there has been ongoing activity and development on this project and we have identified a significant landowner who is supportive of the concept of a National Centre within their estate. Following this, there has been considerable further work in respect of the location, both in terms of a possible long term lease and also in respect of the overall business case for the project.

The location identified is Buckminster Lodge, a former equestrian centre, situated on the Leicestershire/Lincolnshire border, close to the towns of Grantham and Melton Mowbray, and approximately five miles from the A1. The site consists of 43 acres of land, with existing buildings and structures on the southern boundary, and lends itself very well to a phased development, with the potential to accommodate flying activity early in the development.

The land parcel is largely flat, level, well drained and mostly under grass. Also, and importantly, surrounding land is under the same ownership. The site is well away from noise sensitive premises (NSP's) and is in open countryside.

We have worked closely with the landowner towards establishing a long term lease for the use of the land for model flying and the establishing of a visitor centre with supporting facilities.

CREDIT: BMFA & Paul Bancroft Architects

Concurrently we have also been working with the local authorities in respect of planning permission and the longer term development of a national facility. We have now received formal confirmation that planning for change of use for model flying, and also the initial phases of building refurbishment and development, has been granted.

This represents the last of the 'critical gating factors' to be addressed in order that the project can move forward.

The BMFA's aim is that the facility will be 'officially open' in the spring for limited activity.

In the meantime please respect the privacy and security of our landlord and do not visit the location. We will be making plenty of opportunities to visit and view the site through the development phases for those who are interested in following the progress of the project.

I look forward to providing further updates as we move forward."

Thanks, Manny. It all sounds very exciting and we look forward to taking you up on your offer to view the site, probably early next year, so that we can pass more details on to our readers.

Electric Bolt

One of our regular kit reviewers, Josh Spiers, likes to keep busy between 'review jobs' by building from Traplet plans. Here's his latest creation:

"Hi Kevin

Please find enclosed pictures of the Bolt, which I built from the August free plan.

As you can see, I have modified it somewhat, in as much as I have made it electric powered instead of IC. This meant constructing a hatch for battery access and modifying the front end to accommodate an electric motor.

The more obvious mod was to fit a conventional tail instead of the V-tail original. Purely personal, as I am not a lover of V-tails and how they look. The model is covered in Profilm, mainly dark blue and fluorescent orange on the upper surfaces, with pearl white on the underside.

Specs are as follows:

Span:	*35.5"*
Weight, less LiPo:	*1 lb 4 oz*
Motor:	*HET Typhoon 2w20 EDF can motor, KV 3400*
ESC:	*Jeti 70 A with BEC*
Prop:	*5.25 x 4.75 APC-E*
Producing:	*64 amps, 631 watts*
LiPo:	*Optipower Ultra 2150-3S*
Servos:	*4 x New Power 9 g MG*

At the time of writing I have not flown the Bolt due to a change in the weather here in Devon – high winds and rain! Saying that, I have no worries about the maiden flight whatsoever, if it looks right, it'll fly right and it's not the first John Rutter design that I have built either. I had the Contra Twin, which was superb to fly and unusual to boot."

Many thanks for sending pictures and details of your electric conversion of the Bolt, Josh. No doubt you have flown it by now? Do let us know how you got on.

Amethyst Falcon Grows Up

"Hi Kevin,

My name is Connie Conradie and I live in a small town called Thabazimbi in the North Western parts of South Africa. I thought you would like to see a model of the Amethyst Falcon that I built from a free plan I found in RCMW a while back.

Since I had some hardware available, which I scavenged from a defunct Funtana 100, I decided to use that in the Falcon. However, the motor I had was an OS 120 AX and since it was way too big for the available plan I decided to scale the plan up. Fortunately, I have access to a large bed printer that can print up to size A0 so the plan was scaled up to deliver a model at one third scale. All up weight turns the wife's bathroom scale at 7 kg.

At this size the cockpit turned out to be quite a large and open cavity. So a complete instrument panel with full instrumentation and radio was installed, along with a control stick, throttle controls, small fire extinguisher and a pilot occupying the hot seat. At third scale, finding a suitable body to represent our Australian friends from 'Down Under' was impossible so a pilot was made out of balsa and installed in the cockpit.

As per plan the tail servos were installed in the rear, making for short, stiff connecting rods. Ailerons are powered by servos in the lower wing panels, with connecting rods linking the lower and upper ailerons. The radio gear and battery live under the cockpit floor, with the obligatory switch in the left side panel just aft of the lower cockpit window.

Even at this size fitting the engine was not so easy, since the available length was limited. The engine was installed as far back as possible to allow the use of the standard muffler used in the 'Pitts' configuration without lengthening the nose and spoiling the lines of the design. The fuel tank and 9 g throttle servo live in a compartment between the firewall and the cockpit bulkhead, with a large underside hatch providing access for servicing.

To date the model has yet to be flown due to interference from life and its eccentricities. But watch this space – it will happen!"

Thanks for letting us see your scaled up Falcon, Connie. And thanks also for sending details of your other recent models, which we will feature in future issues as space allows.

Amethyst Falcon – Original Plan

The original plan that Connie scaled up his model from was designed by Roger Vaughan and results in a 36-inch span scale ultra-light biplane for four function R/C and 200 W brushless motors. Available from Traplet Publications Limited (Plans Service), the order code is MW3554. A laser cut wood pack is also available for this model, WP3554.

For the latest prices please contact: Traplet Publications Limited (Plans Service), Traplet House, Willow End Park, Blackmore Park Road, Welland, Malvern WR13 6NN. Or telephone the hotline: +44 (0) 1684 588599, email: orders@traplet.co.uk or order online at www.trapletshop.com

UK Drone Show

The UK Drone Show 2016 is now only a few weeks away and the clock is ticking as we count down to one of Europe's best and largest drone shows. Our sister magazine, RC Flight Camera Action, will be there to report on all the action, including a preview of the mind blowing Drone Racing ISeries. This year the UK Drone Show is lucky enough to be featuring two of the world's greatest names in FPV racing, Luke Bannister (World and UK Champion) and Tom Smith (DRL pilot). Check this link out for a glimpse of the kind of flying that you can expect to see:

www.youtube.com/watch?v=Ef2wBVLfzdI

If you didn't manage to get to the UK drone show last year, here's a snapshot of what to expect:

www.youtube.com/watch?v=xx5R8k0SRgk

Alongside an action packed live drone workshop, this year's UK Drone Show will also have a specially picked team of speakers ready to share their knowledge and expertise. Technology giants Panasonic are again the event's main sponsor, and they will be joined by drone industry leaders DJI and Parrot. With a wide range of exhibitors, including the country's leading retailers and independent specialists, the UK Drone Show is a must for the whole drone community. Be sure to pop by the RC Flight Camera Action stand to buy a copy of the magazine and to watch our amazing 3D printers in action.

Find out more by visiting the show website:

www.ukdroneshow.com

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Jetco Navigator

One of our regular contacts from Australia, Peter Kraus, has been busy building a gem of a kit that he dusted off from underneath his workbench:

"Hi Kevin

At last, at age 74 and some two and a half years after retiring, I'm finding that I'm catching up with a lot of 'honey dos' and just getting enough energy to get into the workshop. I have a large number of projects to finish after a 20 plus year gap; when I have gone out to fly lately it has been with ARTF electrics.

I've wanted a seaplane for some time as we have some water around here which may from time to time be calm enough. So I was tempted to look at some of the nice ARTF foamie flying boats currently available. But when I looked under the workshop bench I realised I had a 1950s/60s Jetco Navigator kit, bought years ago from the widow of a club member who had passed on. I could maybe have sold it and put the money towards another ARTF but I thought 'a bird in the hand is worth two in the bush', not to mention that it would get me back into building mode before getting stuck into some of the projects which I have kept so long as they are dear to my heart.

I'll send you some pics when it's ready but in the meantime I am taking a few along the way as I have in mind submitting an article on the joys and challenges of building a 50 or 60 year old kit."

After a spate of activity at his building board, Peter now has a recognisable airframe:

"Here's a not very good picture of the Jetco Navigator I told you I was building. I have some construction photos taken along the way and will put it all into an article, soon I hope. As you can see it is now getting close to the '90% finished, 90% ready to go' stage."

Many thanks for sharing your Navigator build with us Peter. We imagine that many other readers will have old/classic kits collecting dust in their workshops and garages, or stored in the loft – we certainly do! If you have recently found such a model and are busy preparing it for flight then please send us some pictures and brief details. We would love to see what you've had tucked away for all those years!

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A Neo Air for Iwata Air Compressor with international plugs and air hose, three speeds (1-15 PSI/0.07-1.03 Bar/0.007-0.103 MPa) for small, general airbrush applications
A Neo for Iwata CN Gravity Feed, Dual Action Airbrush with two cup sizes that allows fine to medium spray performance for your small to medium sized painting projects
Three bottles of Medea Com-Art Colours (1 oz) airbrush ready, non-toxic, water based acrylic paint
A bottle of Medea Airbrush Cleaner (1 oz), a ready to use water based cleaner
Online practice exercises

www.airbrushes.com

HACKER MIG 3 WINTER ARF

Another excellent addition to Hacker's EPP Fun Fighters Series, the MiG 3 is a profile scale, high performance model perfect for outdoor flying. This 840 mm warbird comes pre-painted, with wing and horizontal stabilizers, a clear canopy, engine mount, pushrods and comes with complete hardware and an instruction guide. Check the Hacker website for items needed to complete.

www.zoomport.eu/shop/

ETRONIX POWER PAL 2.0 AC/DC INTELLIGENT BALANCE CHARGER

The latest addition to the Etronix charger stable sees the original Power Pal AC/DC balance charger receive a full face lift with the new 2.0 edition. Housed in a more stylish and compact case, the 2.0 now includes the latest charging software for today's modern batteries, such as LiPo High Voltage batteries (LiHV). It's easy to navigate and the programming flow makes it a must for any modeller looking to upgrade from a basic fixed rate charger. Catering for LiPo, Li-Ion, LiFe, LiHV, NiMH, NiCd and PB batteries it would make a good choice for your first advanced charger.

www.cmldistribution.co.uk

REALFLIGHT RF-X SIM

RealFlight now has more to offer than ever before! The highly developed physics, which have always drawn pilots to RealFlight, are back and further improved with upgraded graphics, driven by UNIGINE. You can fly through a world that is detailed down to the last blade of grass, and do it effortlessly. Accessing RealFlight is easier than ever as its intuitive interface gets you up and flying in no time. Once in, RealFlight say that the unbounded flying sites – especially the huge Sierra Nevada experience – will astound and draw you in with incredible detail. Numerous favourite sites have been remastered and over fifty new aircraft, detailed down to their panel lines and rivets, await your every command!

www.hobbico.de

PICHLER CRACK FOKKER

Just in time for the indoor season, Pichler Modellbau have introduced a new series of flat foam models. The 'Crack Fokker' shown here has an 890 mm wingspan and thanks to the triple-wing structure extremely tight manoeuvres can be flown with it. For more information on other models in the range check out the Pichler website.

www.pichler-modellbau.de

RIPMAX BOLERO

Bolero is a high performance fun-fly aircraft with huge control surfaces. It has been made with the aim of providing the next generation of fun-fly 3D aircraft, building on the success of models such as Ripmax's Bossanova. With easy to install and access power and radio installations, this CAD designed model has been optimised for performance and durability. It can be wild in experienced hands but don't let that scare any novice aerobatic pilots – if you reduce the control movements it becomes docile enough to learn aerobatics and makes a great first mid-wing model. The Bolero is predictable, smooth and extremely capable, with the ability to progress with you as you become a 3D pro!

www.ripmax.com

SIMTOO FOLLOW ME DRONE

Simtoo is a foldable drone that is compact enough to fit into the small 34 x 24 x 13 cm carry case provided. It is supplied with everything you need to assemble and fly. Simple and easy to use, Simtoo is claimed to be ready to fly in less than two minutes from taking it out of the box. No previous flying experience is needed as the Follow ME drone technology is there to make flying easy. Also included in the package is a gimbal and camera. The gimbal is controlled via a watch and enables the camera to catch smooth shots while the drone is flying. It can also be viewed in real time from an iOS or Android smart device.

www.simtoodrone.co.uk/

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Firefly

Daniel Johns sees the light as he tries out night flying for the first time with a highly illuminated fun-flyer from the FMS stable

Testing the lights. There are 15 LED light strips in total

The colourful outer box

Airframe components are protected during transit by this sturdy foam tray

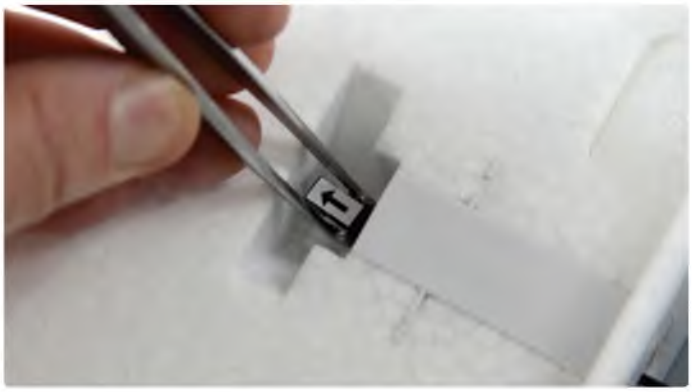
The 1100MM Firefly from FMS is a quick build, fun-fly style aeroplane from FMS, who are probably more familiar to RCMW readers for their highly detailed foam warbirds, which often come festooned with lots of extra functions like flaps, retracts and working gear doors. Although the Firefly is a relatively simple sport design it has its fair share of add on extras too, but this time in the form of multiple LED light strips that are fitted internally throughout the airframe and which light it up like the proverbial Christmas tree when darkness falls across the flying field.

The model features elliptical wings and a short moment arm, with quite a short rear fuselage that ends in a large fin and rudder assembly. The large fin aside, it reminds me of those control line stunters that I built many years ago and hence I wasn't surprised to find that it excels in looping manoeuvres.

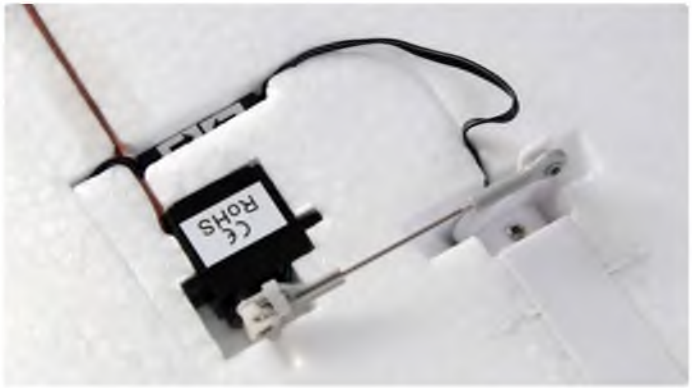
Another quirk of the Firefly is that it uses swivelling wingtips instead of ailerons to bank and roll the aircraft. At first I was a bit worried that the small servos that come pre-fitted for this task would be a bit overwhelmed but it appears that FMS have done their sums correctly and all works well in this department.

Also, I have seen quite a few models with all moving tails, and one or two with all moving wings, but this is the first I have come across with all moving wingtips. I have always believed that extending ailerons to the very tips of a model was a bad thing, as the vortex's generated at the tips could lead to severe aileron flutter.

Firefly parts spread



A pair of tweezers comes in handy to pull the light leads through the wingtip tubes



Wingtip servo and linkage connected to a steering arm. Any excess wiring can be tucked into the deep grooves pre-cut into the surface of the wing

However, it seems that FMS have thought about this and they have fitted a generously sized wing fence just inboard of each wingtip, thus deflecting the worst of any turbulence away from the tip mounted control surfaces. I could be completely wrong about the aerodynamics of all this, so please let's not have any angry emails to the editor. Suffice to say that the movable wingtips appear to work well and without any signs of flutter – at least not at sensible flying speeds!

Six Piece Plane

Firefly's airframe is supplied in six main pieces: the one-piece fuselage and fin (with the rudder pre-attached), two tailplane halves, two wingtips and a large centre section that is almost as wide as it is long. Each part is well secured to a moulded foam tray that slides out of the end of the colourful outer box, thus helping to prevent any damage in transit. The airframe parts are supplied decorated with a simple black and yellow trim scheme that complements the model's design rather well, so there are no sticker sheets to cut out, which can rather slow down the assembly of a quick build foam kit such as this.

Assembly time is quoted as ten minutes and indeed the basic airframe can be completed in such a short amount of time. But I would caution against such a race against the clock and to make sure that you complete each stage properly.

A neatly illustrated 18-page manual is supplied, with clear diagrams showing each stage of assembly. The wingtips are attached first, after sliding them into close fitting outer tubes mounted in the face of each wing fence, where they are secured to steering arms with small self tapping screws. The LED light strip leads need to be inserted through the middle of the tubes and a pair of tweezers come in very handy here to pluck the leads out of the holes where the steering arms sit. The leads can then be plugged in to matching sockets on the short extension leads that are fitted to the ends of the light strips located along the leading edges of the wing centre section.

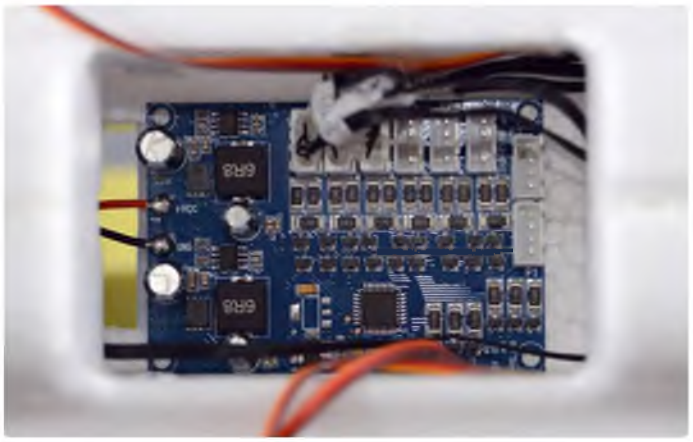
I found that this was one area where extra care was beneficial, to make sure that the wingtips swivelled without any binding. On my first effort one tip was a bit tight but this was relieved by loosening the fixing screw slightly and gently pulling on the wingtip as the screw was re-tightened.

Next, the two tailplane halves are fitted, sliding them onto a long joiner tube before securing with a small self tapper on each side. As with the wingtips each half is fitted with a light strip plug that has to be plugged into an extension lead that you will find sticking out of each side of the tailplane mounting recess. Naturally, there is a bit of excess wiring here and this needs to be carefully tucked away back into the fuselage before the tailplane is finally secured.

The now one-piece wing is then fitted to the fuselage, making sure that all its servo and light strip wires are fed through a large hole in the underside of the fuselage

Tailplane recess showing the elevator servo and a tailplane light lead. One pair of connectors has already been tucked into the front of the recess

Matching up the arrows on the connectors ensures that the pins are fitted in the correct orientation



The lighting control board, with the XH light strip sockets starting to be populated

The hole in the wing bay is thick enough to mount a small receiver. The servo leads are marked with labels showing their respective functions

Six 'twist & lock' fasteners are used to secure the wing

A semi-circular lug on the front of the undercarriage assembly ensures correct alignment

without trapping any inbetween the wing/fuselage join. Inside this hole you will find the lighting control board, with matching XH style sockets into which the eight LED light strip leads have to be fitted. The leads are numbered so this is very easy to complete.

The edges of the access hole are just deep enough to mount a small receiver. You need five channels to operate this model, so my Spektrum AR610 was perfect for the job. The servo extension leads supplied by FMS are all fitted with stickers showing their respective functions, thus making wiring up the Rx another simple task.

The wing is firmly attached using six 'twist & lock' fasteners; I have seen such wing fixings before and they work really well, so I am surprised that they are not used more often. And since six are used there is plenty of redundancy should you accidentally forget to tighten one fully and it falls out!

The final assembly job is to screw on the factory built undercarriage unit, which comes complete with free running foam wheels. Made from blue anodised alloy, it has a semi-circular lug on the front of the fixing plate and this fits neatly into a matching indent at the front of the undercarriage mount, so there's no confusion about which way round it needs to be fitted.

Control Linkages

Individual 9 g metal geared digital servos are mounted close to each wingtip, the rudder and the elevator. They are all connected using short pushrods that have swing keepers at the servo arm ends and small ball-links at the control horns. They work well but I did catch one of the aileron linkages on some clothing and the small screw that holds the ball against the control horn popped out. Upon examination I could see that the tiny thread was screwed into quite a thin control horn and as it had ripped out then it was likely that it would do so again.

Rather than risk it doing this in flight I decided to replace the aileron ball-link screws with some 1.6 mm bolts from a micro helicopter. These were long enough to pass through to the other side of the control horns where they could be secured with a nut, locked in place with a dab of thread locker. To do this the small holes in the balls and the control horns needed to be reamed out slightly using a hand turned drill in a Dremel chuck, followed by a quick tidy up with a needle nose file.

Having replaced both aileron screws I had a careful look at the elevator and rudder

The prop nut is tightened using an Allen key or similar as a tommy bar

The spinner is grooved to allow cooling air to enter the model, assisted by vents on either side of the cowling. Note the decent amount of side-thrust

All wired up and ready for the maiden flight

With its short fuselage and broad wings the Firefly is reminiscent of a control line stunt model (but not the KK namesake!)

Firefly trundles away for a fuss free first take-off

ball-links but these seemed much more secure. The rear control horns are double the thickness of those used for the ailerons so there was plenty of meat for the tiny screws to bite into. However, as I had all the tools to hand to fit small bolts, and I had worked out how to ream out the holes in the balls (using a wrap of fine sandpaper to gently hold them with pliers), I decided to replace them anyway.

Setting Up

Lifting off the magnetic battery hatch reveals a generous bay into which a 3S 2200 mAh LiPo can be fitted. The battery bay is fitted with hook and loop retaining straps but to achieve the recommended Centre of Gravity, I found that I needed to mount the pack quite a way forward and, hence, it missed the rear strap. Actually, as is often the case with ARTF models, the recommended C of G is very conservative so I have gradually been pulling the pack backwards, but it's still a little bit shy of the rear strap. So to provide a more secure LiPo fixing I have run a strip self-adhesive hook and loop tape down both the LiPo and the length of the battery bay floor, which is standard practice for me anyway.

The instructions give suggested high and low rate settings, and whilst past experience served well to anticipate what the elevator and rudder movements would be like in flight, I had no idea about how efficient the all moving wingtips would be. So I stuck rigidly to the recommended settings. In the event, at high rates, I found the elevator to be just about right. A bit more rudder would be appreciated, but a heck of a lot more aileron was required.

Having said that the model is flyable at the high rate settings, so I can recommend them as a good starting point for any experienced pilots thinking of buying this model with which to try night flying for the first time. Maybe you should have a couple of higher rates ready on a Flight Mode switch, just in case you find things a bit too tame?

You may have concerns about the correct direction of the wingtips but really they work just like standard ailerons. If you stand behind the model and push the aileron stick to, say, the left, then the trailing edge of left hand wingtip should rise up 'to meet the stick'. Ditto for the right hand side.

One of my final checks when assembling a foam model is to see if the tailplane is level with the trailing edge of the wing. Often the tail will be slightly out, as it was in this case. The remedy is to insert thin card shims either

A flypast for the camera reveals the need for a little more rudder throw to crank the model over for knife-edge

Firefly excels at looping manoeuvres

She rolls well too – once the wingtip movement has been cranked up!

Showing off her six point wing mount and stylish blue undercart

Firefly is easy to land but needs a gentle touch on the elevator to avoid porpoising during the flare

side of the tailplane mount until it is level. An old business card is ideal for this. The shims can be secured with dabs of foam-safe cyano or a small strip of white insulating tape.

Light It Up!

It was now time to test the lighting system, so I pulled the curtains, switched off the lights and plugged the balance lead of the LiPo into the XH socket fitted to the end of the lighting control board's power lead. All the light strips lit up in a variety of red, green and blue hues; there are fifteen four colour lamp assemblies in total.

I had intended to use a three position switch to select three of the four available colour modes but I soon discovered that the control board doesn't work like that. Rather it works as a sequencer, so each flick of an auxiliary channel switch moves it onto the next 'shining' mode. I therefore used the Switch Select function on my Spektrum Tx to move the lighting control to the Gear switch, making it much easier to operate in flight.

In the first mode all the lamps remain lit up but the wingtips flash, much like navigation lights. The other modes set various other lamps flashing, and the last one gets them all on the go, which is a bit of an eyeful!

With everything checked over it was time to attach the propeller using the tommy-bar prop nut supplied. The front of the nut is threaded to accept the spinner retaining screw. The spinner and backplate are grooved to allow cooling air to flow through to motor and battery bay. The warm air exits from a hole in the bottom of the rear fuselage.

First Flights

For the trimming flights I decided to test fly the Firefly on a calm autumn day. With low rates selected she floated off the ground in a gentle fashion. The trims seemed pretty good so a left hand bank was initiated. She was slow to respond so I flicked to high rates. The next turn was better and I now felt that I had an acceptable level of roll control. Even so, after a couple of circuits I decided that more aileron throw would be needed before I could risk trying any aerobatics, so the Firefly was brought round onto finals. A slow but well controlled descent was followed by a gentle landing.

When setting up the wingtips I noticed that they had a large range of movement at 100% servo travel. But being unsure of the amount of wingtip movement that would be needed, I decided to use the Dual Rate function to reduce the movement to the low amounts shown in the instructions. This meant that I had plenty of leeway to wind the movement back up again. This time I set the high rates shown in the manual as my Low Rate setting, with the Medium and High rates giving progressively higher rates if necessary.

Back in the air it wasn't long before I had flicked through to my new highest rate setting. You can see the extent of this in one of the pictures as the model is rolled; at the high rate setting in the manual the wingtip doesn't rise above the level of the wing fence, but here you can see that the tips now extend far above and below the wing fences. At such settings the Firefly will roll with ease.

There's no such doubts over the elevator though and the high rate setting suggested seems just about right for some spirited sport

Taking off at dusk. There's still a bit too much light for the light strips to really shine

Framed against a darkening sky, Firefly really starts to light up

flying. The rudder is a bit on the tame side though and I will be looking to increase this a bit to improve knife edge performance, as well as giving more control in stall turns.

After three packs and a bit of rate fiddling I was delighted with the performance of the Firefly, especially as all the trims were found to be still at neutral. Another daytime session followed, this time on a windy day, and from this I decided that a bit of down trim was required to stop the Firefly from ballooning as she turned into wind. This was dialled in manually by screwing in the elevator swing keeper, thus ensuring that the sub trim was kept at zero.

Night Falls

In autumn the nights seem to draw in all too quickly – until you want to test out a new night flying model that is! Time then seems to slow to a crawl. As soon as dusk started to settle over the flying field I loaded a LiPo pack into the Firefly and took off. Even in twilight it's surprising how much light is still left in the sky and at normal cruising heights the light strips were barely visible. However, things were very different during low passes and when flown below the tree line the Firefly was well illuminated.

Even if you don't intend to fly at night a model like this would be very handy to increase the time that you can stay at the flying field when evening flying. Conventional models can quickly disappear into the gloom when landing at the end of the day, but the addition of a few light strips really does help you to maintain visual contact when the model dips below the horizon.

After a short coffee break things had become a lot darker, helped no end by some menacing dark clouds across the northern part of the sky. When arced across that section of sky the Firefly really showed off her colours well and I was able to enjoy flicking through the various colour modes to see which ones I preferred. Rather predictably I tended to settle for the default scheme of static airframe lights, with flashing wingtips.

By now things had got well and truly dark, but I found that I was able to track the Firefly through my usual aerobatic repertoire with ease and at no time did I feel that I was losing visual contact with the model.

The earlier flight revealed that the light strips were not very power hungry so it was safe to keep my Tx timer at its usual count-down time of five minutes. I'm sure another minute could be stretched out with this model but my packs are a couple of years old now, so I played it safe and brought the model in for a bit of a bouncy landing.

The bright lights really show up well when the model is flown below the horizon

This is really the only phase of flight where I could wish for a little more illumination as a bit more white light shining directly down from the underbelly to light up the ground during the last few seconds would help me to gauge the flare a little bit better. But it's early days (or should that be nights?) and I need to test the other colour modes to see if they provide more light for landing. I suspect that the fast flashing mode may provide just that bit more bright light that's needed in those final few seconds when flying close to the ground.

Overall then, I can thoroughly recommend the FMS Firefly as the perfect introduction to night flying – and it makes a pretty good daytime sports model too, without the balance lead plugged in!

One final thought. The prominence of the 1000MM prefix in the model's title suggests that this could be the first in a series of different Firefly designs. Time will tell on that score, but based on the success of this compact 43-incher then a bigger version would certainly be most welcome. ***RCMW***

RC MODEL WORLD

MODEL INFORMATION

NAME:	1100MM Firefly
MANUFACTURER:	FMS
DISTRIBUTOR:	CML Distribution
WEBSITE:	www.cmldistribution.co.uk (search for Firefly)
PRICE:	£219.99
MODEL TYPE:	Sport aerobatic with LED light strips
CONSTRUCTION:	Moulded foam
PARTS SUPPLIED:	Airframe, brushless motor, ESC, 15 LED light strips, lighting control board
PARTS REQUIRED:	3S 2200 mAh LiPo, transmitter and receiver (5 channel minimum)

Dislikes

C of G and aileron recommendations are a bit cautious. But better safe than sorry!

SPECIFICATIONS

WINGSPAN:	42.9 in (1090 mm)
LENGTH:	40.2 in (1020 mm)
WING AREA:	500.7 sq in (32.3 sq dm)
FLYING WEIGHT:	45.9 oz (1300 g)
WING LOADING:	0.092 oz/sq in (40.2 g/sq dm)
MOTOR SIZE:	3536-KV1250
PROPELLER:	11 x 5.5 inches
SERVOS:	9 g digital, metal gears

R/C FUNCTIONS

1:	Throttle
2:	Aileron
3:	Elevator
4:	Rudder
5:	LED Lights

Likes

Fast, easy assembly • Pleasing retro style design
Swivelling ailerons are interesting and work well
Light strips work well and extend flying hours
Light control board gives varied options
And... Firefly is easy to fly!

Scale World Championships 2016

Neil Tidey is our reporter as Team GB win the Bronze medal at the FAI World Scale Championships in Romania

Andreas Luthi takes off for a near perfect flight

The Brits - Reeves, Crapp, Toyer, Tidey and Kessel

Richard Crapp contemplates the damage to his Wessex after hitting a runway light

The venue for the 2016 World Scale Championships was Ploiești in Romania, who successfully hosted World Model Championships previously, including free flight and space models.

Ploiești is a major town to the north of Bucharest, the capital of Romania. It was the scene of operation 'Tidal Wave', the allied bombing in 1943 in an attempt to destroy the oil wells vital to Germany's war supplies. It was also the scene of a crash involving the world's first all metal aeroplane, which was built in Romania.

The Scale Championships are far more demanding and costly as an airfield with runways has to be taken for the week's competition, with hangar space for the models, as well as camping and local hotels. Being on the edge of Europe huge distances have to be travelled by road or air from many countries and this is expensive with large models. The judges, jury and FAI personnel all add to the cost of the Championships.

Unfortunately, Romania did not prove to be a popular venue and some European teams, including Germany, did not attend. For the first time in over 40 years of the Championship, GB could not make a team for the major F4C event, even though team trials had been held.

The Competitors

Although not well supported, there were entries from 10 countries and the top competitors included Marc Levy from France, Andreas Luthi from Switzerland and David Law from Australia, who took the top three places in F4C at the previous Championships in France.

Richard Crapp and Dave Toyer were joined by Mick Reeves and Steve Kessell as Team Manager for the GB F4H team. Richard and Dave were part of the team that gained a Silver medal at the previous Championships in France. David Kopal from the Czech Repulic and Daniel Boulanger from France, who placed first and second in F4H in France also came to compete. So although the entries were down the major competitors came, making the event a true competition.

Travel

Romania would take probably three days to travel by road from GB; a long and tedious journey. The answer was for the team to travel by air and to send the models separately. The models were packed into boxes approximately 1800 x 700 x 700 mm and transported by DHL. Each box was collected from the competitor's house and delivered direct to the airfield. DHL were certainly very efficient and the models arrived safely.

Australian Anthony Ogle worked into the night to replace his engine

Cockpit details of Andreas Luthi's Bucker Jungmann

Marc Levy's Fouga with the town of Ploiești in the background

Second placed Marc Levy assembles his Fouga Magister

The Australian and French teams travelled similarly, while the Italians travelled by road and made the last 45Km in Romania on dirt roads!

Competition Rules

For the majority of readers, F4C and F4H will mean little. Briefly, both categories have a flying schedule made up of compulsory and optional manoeuvres, and anyone who can fly the BMFA 'B' test should be capable of flying these. The model has a maximum weight of 15 kg. For F4C the model has to have been built by the competitor and very comprehensive documentation is required to prove accuracy and colour.

F4H is a new competition and it was introduced in 2014. The model has to be finished by the competitor but not necessarily built. An ARTF could be repainted to a represent a full size aircraft, but photos would be needed to show the accuracy of the representation. This competition actually attracted more competitors than F4C but many of the models had origins in F4C.

The Venue

The roads from Bucharest to Ploiești are excellent and there are considerable improvements taking place on the minor roads. Auchan and Carrefore supermarkets are well established and shopping malls are of a very high standard. Romania is certainly advancing as a country.

The huge airfield had a tarmac runway about 30 m wide and in good condition. A grass runway had been promised but this was not prepared. Models of early aircraft have limited crosswind capability and this proved a problem during the competition. The full size aircraft of the training academy were able to operate at the end of the runway without affecting the competition. Two large hangars were made available for preparation of the models and static judging. A small bar next to the camping area provided drinks and light meals.

We had decided to stay in the academy lodgings and have the meals provided. This was very convenient and adequate – Romania is not known for its cuisine! The Italian and Czech teams camped on the airfield, while the judges and other teams stayed at the four star Hotel Central in the town. With hindsight this was probably better, although not so convenient.

Adventure And Friendship

It was a Friday 2 am start to get to Stanstead for a 6.30 am flight to Bucharest. A VW minibus was hired and we eventually arrived on site at about midday. Then we unpacked the boxes and assembled the aircraft. We had decided to stay on site at the academy, so dinner and an early night followed.

The airfield was available on Saturday and Sunday for test flying and the airspace was kept busy. Fuel was bought in Romania as it was not possible to carry our own. All three GB models were fitted with Laser engines and the Coolpower fuel suited them well.

Richard decided on a test flight with his Westland Wessex during Saturday and on landing he hit a landing light, damaging the model. The French team immediately offered help with glues and materials for the repairs. Dave and Mick did engine tests but did not fly.

Anthony Ogle was a newcomer to the Australian team and had entered F4H. During testing the master rod on his radial engine decided to quit. It was not possible to repair and a DLE 30 was kindly loaned.

Pavel Fencl's Knoller

Some of the remarkable detail on third placed Pavel Fencl's Knoller

David Law and helper Mel hold back the powerful Pitts

Mick Reeves' model being static judged

Richard Crapp's Wessex on finals

F4H World Champion, Daniel Boulanger takes his Gaudron off into the crosswind

Close in detail of Kopal's Stearman

David Kopal's Stearman accelerates for a second placed flight

This was fitted during the evening and he succeeded in flying his Nieuport in the competition.

The French and Italians organised a party on the Thursday night, which was a great opportunity to talk. Fortunately, English was the common language!

Prize giving was held at the airfield, with the flag lowering ceremonies followed by the traditional end of competition banquet held at the Central Hotel in Ploiești.

Highlights - F4C

Sadly, as previously mentioned, there were no GB entries in this, the top competition.

Andreas Luthi had won the Championships four times with his Bucker Jungmann, powered by a Zenoah 62 converted to glow to save weight and increase power. He came second in France and as the weight limit had increased he changed the engine to a Roto 80 four-stroke. This gave an increase in performance and a better sound. He told me that his model was repaired after a crash following a spin when the engine cut, but there were certainly no signs of repairs at the competition. His competition flights were clinical and after only the second flight he had won the F4C World Championship.

Marc Levy won in France and his model was beautifully prepared. He had practice flights during the weekend and his jet powered Fouga was exceptionally smooth and graceful.

Perhaps the surprise of the meeting was third placed Pavel Fencl from the Czech Republic. I first met Pavel at the 1992 World Championships in the USA and he won the Championship in South Africa in 1998. Originally powered by an OS 120 and re engined with a Laser 180, the Knoller has flown in every World Championship since being built. It is a very accurate model and has certainly stood the test of time.

David Law placed third in France but

Early Romanian aircraft history is celebrated on a current bank note

The aftermath of the Romania's relationship with Russia can be seen outside the aviation museum in Bucharest

A model of a remarkable Romanian aircraft in the museum, but the details were all in Romanian!

Unusual and rather attractive transport from hangar to flight line

Yannic Bueb's electric Albatros. The OS four-stroke used to create engine sound can be seen on the rear bulkhead

Unlucky Australian Noel Findlay just caught the grass edge of the runway with his DH Fox Moth

dropped to fifth with his superb Pitts Special. This was quite a surprise. Perhaps it was a case of too much power from his two-stroke DLE twin, giving an unrealistic flight pattern and frenetic sound.

Highlights – F4H

This attracted an increased entry, similar to the number of competitors in F4C. My feeling is that it could even become the major event in the future, and certainly could be the class with the highest entry. The GB team collected the Bronze medal, a really good result.

Daniel Boulanger from France, flying his Caudron, won the event. Marc Levy told me he had spent time with Daniel setting up the model and gyro. This certainly paid off, with smooth accurate flying, even with a crosswind. The Caudron is a light French touring aircraft, the model was 1/4 scale and was powered by a Laser 150.

David Kopal from the Czech Republic placed second with his Stearman, two-stroke petrol powered. He had beaten Daniel in France. Third placed Max Schilt from Switzerland flew his electric powered K&W C3603; the model was originally powered, some years ago, by Max's own three cylinder four-stroke engine.

Richard Crapp placed fifth with Dave Toyer seventh and Mick Reeves twelfth, giving the GB team an excellent third place.

Trends

Two years ago gyros were introduced in both F4C and F4H. Although it was suspected that some may have been used previously, a major problem was actually detecting them. All the top competitors now use them. The advantage is that it can enable models to fly better in windy conditions – just imagine a car without shock absorbers! The slower models such as Daniel Boulanger's Caudron or Pavel Fencl's Knoller really suffer in crosswinds. The gyro acts quicker than the pilot and steadies the model. The GB Scale Technical Committee has only ratified the use of gyros for 2017. Richard and Mick have recently fitted gyros but not been able to experience and develop their use in competition, which was a significant disadvantage.

Jet powered models are very competitive, Marc Levy being the first to win the Championship. They are less affected by conditions and their speed enables them to negate the effects of wind. It is unlikely that any jet would not be equipped with a gyro. The jets also gained very high points for engine sound. Surprisingly, we have not seen jets in scale competitions in the UK.

I did think that we would see more electric powered models. They are simpler to operate, can turn larger scale propellers and the weight of the battery is not included in the weight of the model. However, they do reach the limit of duration during a flight. And another major problem is that the airlines and carriers do not like transporting Lithium batteries.

There was only one more electric powered model compared with the last Championships. Models are judged on realism of sound and Adam Jaskiel from Austria had an interesting electric sound system in his Hawker Sea Hurricane, but it did not quite synchronise with the throttle. Yannic Bueb from France had a small OS four-stroke engine installed in his Albatros DVa for sound. The Pilatus Porter of Gody Fischer from Switzerland was virtually

Australian Noel Whitehead's Pacific Aerospace Corp T4

Norway's Per Iversen's Stearman was built from a Flair kit

Karel Vodesil's Bristol F2b, modelled on the full size at Old Warden

Close detail of Italian Alessandro Frizoli's MB339 jet

silent, except for the propeller, yet scored a remarkable 4 out of 10. Max Schilt from Switzerland only had propeller noise and was also very quiet.

Six competitors used Saito three cylinder petrol engines. These sounded good, gave plenty of power and were reliable. I was very pleased that 10 competitors out of the 48 used our Laser four-stroke glow engines. The reliability of the IC and jet engines is extremely good and I can only recall one jet flame-out and one piston engine losing power.

Observations

This Scale World Championship was not well supported by countries or sponsors. This lack of revenue had a serious effect on communications, but despite that we did have a good Championship. Despite many problems, Marius Connu and his Romanian team really did a wonderful job. Without them we would not have had a Championship at all.

For me, the Australians were the stars of the event. Their enthusiasm was fantastic and Romania will be blessed with many furry Koala bears for the children; the inflatable Kangaroo was a prominent feature!

I admired Anthony Ogle's dedication in fitting a replacement engine and Noel Findlay for stripping his OS 155 down to clean out debris in the pump to get over problems; who knows where it came from? I shall remember this World Championships as the most friendly I have attended.

Thanks also to the BMFA for sponsoring our F4H team, and for covering the cost of transporting the models

In 2018 the World Championships will be in Switzerland. When last held there in 2000, it was a lavish affair. I do hope that Great Britain will sort out a full team and run competitions to the FAI rules. We were one of the top countries in scale not so long ago.

RCMW

Pierro Santucci from Italy works on his beautiful Ansaldo SVA 5

Stars of the event! The Australian team pose for a photo

Above:
The Czech team at the end of competition banquet

Left: The Brits on the podium with winners, France and Switzerland, second

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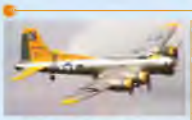

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Les Meilleurs Pilotes Français

Daniel poses in the hangar after winning Gold in F4H at the 2016 Scale World Championships and gives scale to his magnificent model of the Caudron Luciole (Firefly)

'That's Top French Pilots to you...', says Dave Goodenough, as he introduces one of France's scale aces, Daniel Boulanger

With wings folded, just as the original. I am assured that the tubular ground handling wing securing assembly is also scale and that even the small leading edge wing joining covers work exactly as the original

An idyllic scene. The Luciole's pilot preps for for take-off outside maison Boulanger

I first met Daniel Boulanger a few years ago when he was flying at our club's two day scale extravaganza. He appeared to be a quietly spoken and self-effacing sort of chap and his model of the moment, the Caudron Luciole, was flown admirably, though I originally thought it was done without the usual French 'verve'. How very wrong I was! Not only was the model built to a remarkable standard, it was also presented in flight exactly as the type would have been flown. No fuss, no fluster, no nonsense – just a beautifully executed rendition of F-AZAL, the renovated Luciole (Firefly) no.16, originally constructed in the early 1930s. It had been designed to be used as a training aircraft and that's how Daniel flies the model, emulating the steady flying patterns of newbie flyboys. But this is only one of a string of gorgeous models that 'Danny Baker' has constructed, or been involved with. Let's see the how, why and when of this pilot's love of all things model aviation, but first…

The Finest Crystal

When Daniel forwarded his personal information to me, I was very surprised to learn that he is an industrial designer at Cristalleries de Baccarat – Baccarat Crystal – the prestigious French producer of the finest crystal products. The qualities required of him in his profession have obviously influenced the passion for quality, detail and finish that drive him to produce his superb models. Resident in the department of Meurthe-et-Moselle in the Eastern French Lorraine area, Daniel fits his passion for World Championship quality scale models into his busy life; the needs of his wife and two children, and a demanding career are of paramount importance, after all.

He first became interested in model aircraft at the age of fifteen, after watching a TV movie, and becoming enthused as a result. Now fifty one, Daniel admits that the obsession for scale construction and flying has never left him, but drives his enthusiasm to build to the best of his ability and fly his creations in a manner befitting their type. In other words, he's an avid flyer who has to 'get it right' at all times.

His first ever radio controlled model was a Graupner 'Taxi', powered by an OS 30FP; the type of combination that has started legions of R/C flyers on the path to pilot-hood over here on the continent. Typical of his personal drive, even as a teenager, Daniel worked throughout his summer holiday to earn enough to not only buy the plane and motor, but also the 72 MHz (French standard) Robbe Terra Top radio set that he needed, too. I hope he hung onto the radio as the 'retro-style' looks are back in flying fashion!

Daniel's long term project is the Zlin 326 'Master' trainer

The Zlin is beautifully finished. You can see the big DLE motor just inside the air intake

A rear quarter view of the Zlin showing the split flaps and a little taste of the cockpit detail

Competitive Edge

Right from day one Daniel has had the competitive drive – this innate need to always do better, drive harder and gain that 'edge' that takes him beyond the environs of us mere weekend stick wagglers. The first full-on scale model he worked on was the Modèle Réduit d'Avions (MRA) plan for a Grumman Albatross, a 2.25 m wingspan, twin-engined device powered by a pair of OS 32 engines. I reckon that at only 5.5 kg all-up it must have been a decent model to fly.

By 1998 he'd made the transition into designing his own models and constructed the first of several of his successful designs. Like so many of us around the world that have the want or need to design and build our own country's versions of aircraft as scale models, Daniel chose to use French aircraft as his inspiration. Two of his successful models made it into the pages of International Fly magazine, now sadly defunct. Popular at the time, both the Arsenal VG33 (1.8 m span, 4.5 kg, for Laser 100 power) and his Caudron 640 'Typhon' (2.11 m span, 4.7 kg, for twin electrics) were well regarded and Daniel still sells plans for these models. For those that don't know the Typhon, it's the French equivalent of the De Havilland 'Comet' twin-engine racer, looking remarkably similar; a case of repeated form for function, perhaps?

If we're honest with ourselves, we all have a particular aircraft that calls to us – 'build me' it says, with an ever-insistent warble in the ear. For Daniel it was the Caudron C272-5 'Luciole' (Firefly). He admitted that he'd 'had a crush' on this aircraft and just had to build it. In 2007, using the Yvon Mourrier plan as his starting point, he poured heart, soul and at least 1600 hours of work over three years into the model, learning a raft of new skills along the way. Despite originally being built for pleasure, Daniel wisely decided that a well-built and accurate model was a way into the world of competitive scale models. Plus, being in the same arena as top modellers, he would be able to 'black his nose' over other quality craft and also discuss techniques with the best modellers.

He admitted to me that being at championship meetings was a great benefit, losing nothing by being just a 'tourist', yet gaining an enormous amount of background knowledge – nothing lost, everything gained, so to speak. The other side of 'just being there' was the camaraderie; everyone attending is a fan of scale models and the atmosphere of the meetings is always good.

A thing of design beauty! How can you not be entranced by the sweeping lines of the 'Constellation'?

The 'Connie' whiffles past almost noiselessly on its four outrunner electric motors. Built from the Traplet plan, MW3663. A set containing the plan, four ABS cowls and laser cut wood pack is also available, SET3663

Daniel's 'indoor' Sikorsky S39 sits finished, ready to dodge the walls and ceiling of his local sports hall. A masterful model, full of the tiniest detail

Judged By Your Peers

By 2010, Daniel had begun to make his mark in competition, entering the French Championships and gaining a very creditable Vice-Championship placing – remarkable for a first full-on attempt at national level competition. The following year he'd improved even more and took the National Championship title. 'Girding up his loins' in 2012, an attempt was made at full international level scale competition, again within the French Championships. F4C models demand a step change in the level of finish and flying, and it was not a surprise to find the Luciole not as well placed as in an 'ordinary competition'. Yet seventh place overall is not to be sniffed at, especially by a chap that's essentially a new boy to the game.

Hard practice, development of technique and model improvement won a better placing in the 2013 international scale category, a fifth place overall, proving that Daniel was indeed becoming a force to be reckoned with. He also entered the 'flying only' F4H competition and proved beyond a doubt that he was now in the top echelon of French scale flyers by winning the category.

By now, thoroughly versed in the arcane rituals of competition flying, he was selected to form part of the French international team for 2014, flying on 'home turf' down at Marmande, not far from the west coast city of Bordeaux. As he said himself, he was both surprised and personally content with Silver in F4H individual and a Team Gold; a remarkable effort for someone so relatively new to international scale flying. All that hard work had paid off!

Daniel looks serious as the flying surfaces of the S39 are laid out for detailed attention. Note the small parts panel by his right hand

Not All Outdoor Competition

You would imagine that all of Daniel's focus has been on the building and flying of his world championship level Caudron but this is not the case. He's been very active in design and construction of other models of all types – virtually always scale, of course! A long-term project has been the development of his Zlin 326 'Master' trainer, a 3 metre, 14 kg beastie, powered by a DLE 55, which is a very popular 'large model' motor here in France. The project has been ongoing for some six years and, now successfully completed, Daniel intends to make the plans available.

2013 saw the build of a Lockheed 'Super Constellation', a model I have seen in flight at our club scale weekend. It's a beautiful sight in the air and at just over 4 kg for its 2.23 m span, the four outrunner electric motors power it perfectly. A surprise to me was to find that it's a design from the pages of our own favourite Traplet magazine!

Indoor competition also features in his sights, as his gorgeous Sikorsky S39 'Spirit of Africa' attests. This is a remarkable flying confection of disparate pieces, assembled into an aircraft that looks 'cobbled together' from mismatched parts. No matter, Sikorsky designed a winner nonetheless and Daniel has built a super model of it. 1.16 m span, barely 200 g all-up and powered by a single Turnigy 2204 outrunner and 2S 360 mAh LiPo – it's magic!

Even indoor models get the Boulanger scale treatment. This is the engine/nacelle for his Sikorsky S39 'Spirit of Africa'

The S39's balloon tyres are well replicated

The super Sikorsky S39 shows off its struttery and paint job. It's a little over one metre wingspan. Daniel used a pen and airbrush to 'shadow' the tail feather internal construction

The little 'Leduc 010' is given scale by Daniel's mate. A thoroughly flyable model despite its odd 1950s looks. It is constructed from a mix of traditional balsa and the now almost universally used Depron

Happy bunnies both! Daniel (left) poses with the pots and his two Gold medals after his triumph in Romania. The team manager looks well happy!

Another 'odd one' is his rendition of the Leduc 'Flying Stovepipe', the model 010, I believe. This 'before its time' aircraft was ram-jet powered and flew successfully in the early 1950s, being air launched by its Langeudoc parent aircraft. This little Depron delight is thrust along by a tiny ducted fan. I saw it recently in a video clip, howling along in full and very stable control. I wonder if I could convince him to offer the plan to us?

Tailskid

As I tap this epistle into my laptop, the French international scale team are on the way home from Romania, a clutch of medals in hand. Daniel not only 'made the cut' to be there, but won 1st place in F4H stand-off/flying class, helping 'Equipe Francaise' win Team Gold too – a magnificent result!

One of the chaps he beat is our own club 'Patron', Roger Nieto. Roger was placed 8th, behind his British friends Richard Crapp, 6th and Dave Toyer, 7th. Teammate, Jean-Luc Lancuentra came in 9th. Not to be left out, Marc Levy was pipped to the post in F4C Scale, gaining a very creditable 2nd place Silver to add to his 1st in 2014.

I already have an invitation to scope out 'Chez Nieto' and will delve into his toy room next – all for your edification, of course. Never mind the competition, I'll see what drives our military maestro... ***RCMW***

CONTACT
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Ragley Hall
Festival Of Flight

We visit the inaugural event of what will hopefully become an annual autumn treat for modellers in the Midlands

Still in close formation the Grobs get bumped around as they enter their own turbulence whilst writing a large circle in the sky. Impressive flying!

Ragley Hall in Warwickshire, the home of the 9th Marquess and Marchioness of Hertford, provided a stunning backdrop for this brand new family model show

Above: With rain laden clouds providing a dramatic background, Guy Westgate and Tim Dews of the Aerosparx display team line up for a graceful routine of high quality formation flying with their Grob 109 motor gliders

Despite a dire weather forecast, we joined the expectant crowds who braved the elements to visit on the first day of this brand new model show in the heart of Warwickshire. And those who stuck around on Saturday night were treated to some fabulous displays of night flying.

Sunday's visitors had better luck, with perfect conditions throughout the day in which to watch the flying displays, both model and full size, and to shop at the generous selection of trade stands. Here's our pick of Saturday's action... ***RCMW***

Despite a dire forecast on the Saturday the rain clouds did eventually break and some great flying took place. These chaps were first to fire up for the afternoon display

The large petrol powered Fokker D.VIII kept the spectators entertained while other pilots rushed back to the flight line

With the sun out and rain covers off the flight line started to get busy. No such problems on the Sunday though, with decent flying conditions throughout the day

Just after the rain stopped the Canadian schemed Hawk 100 of Steve Johnson was rolled out to line up for its display

Like its sister show at Weston Park the Ragley Hall Festival of Flight is a magnet for turbine powered display aircraft, typified by this impressive Aero L-39 ZA Albatros

Tim Dews' Grob 109 complements the autumn colours unfolding in the tree lined avenue at the far side of the runway

The Editor cannot resist a nice Robin, having trained to fly on type. This one, well protected against the heavy rain showers, is framed by smoke from Horizon Hobby's jet duo

The Pirotti Rebel Pros flown by Sonny Milgate and Aaron Stephens emerge from clouds of smoke leftover from a previous flypast. At times the flight line was completely fogged in!

Horizon Hobby's Pro Duo approach for landing with plenty of smoke oil left in their tanks

Paul Gosling of Nexus Modelling Supplies prepares his mighty Paritech Fox turbine powered glider

FPV drone racing at Ragley Hall was covered by the regional TV news programme

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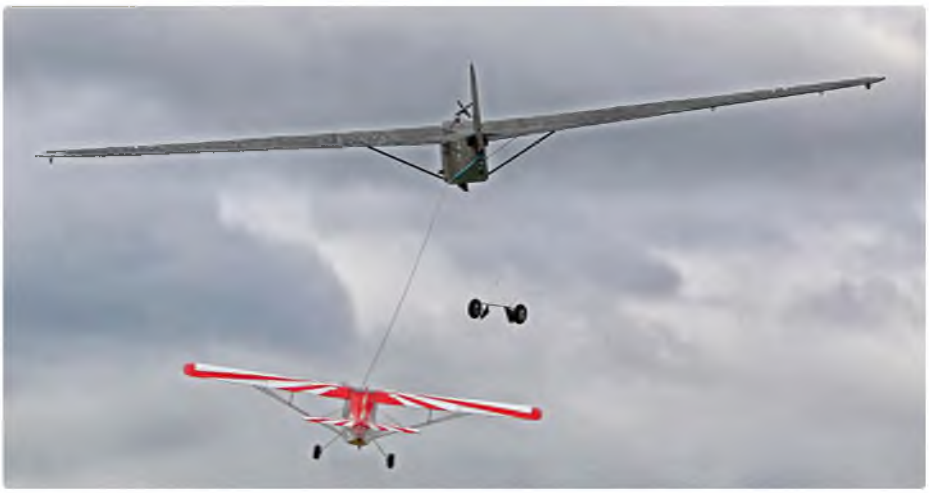
Scale Soaring

Chris Williams reports from the Ghost Squadron Aerotow, Middle Wallop, which took place on Sunday 24th July, 2016

Author's Kite 2a is well at home at Middle Wallop

Simon Newman's Ventus 2cx on its first aerotow flight



Wheels away! The jettison command was a bit late on this launch of the Gotha 242

This, the second of the Ghost Squadron's events at Middle Wallop was, this time around, a one day affair only as the base was holding its Family Day on the Saturday. The optimistic forecast came as a relief to organisers and participants alike, and as the sun rose in the sky we all looked forward to a good day.

First to come under my scrutiny was Gary Bennett's Bergfalke 1. This he had modified from the Traplet Bergfalke II 55 plan to accommodate the different aspects of the two types. Thus, the forward wing sweep was removed, the rudder shape changed and the fuselage shape modified appropriately. Unfinished, but flight-ready, the model seemed to me to be incredibly light, around 8 lb by my estimate and on its maiden flight she floated around to the manner born, to Gary's delight.

Dave Horton's Gotha 242 troop carrier made a return and proved to be almost as float-worthy as the Bergfalke. The Gotha has a drop-off undercarriage, as per the full size, and the idea is to release it soon after take-off: not too soon so as to risk damaging the tailplane should it bounce in an unfriendly fashion, and not too late, as at a decent 32 feet per second it might detract from its structural integrity. On its last flight of the day there seemed to be a misunderstanding between the first and second pilots, as the u/c came off at about 150 feet and the subsequent damage put paid to any more in the way of aviation. (You could hear the pair of them arguing about it for hours afterwards!)

For reasons best known to himself, my pal Motley has got the hots for the Schweizer TG3, a WWII American trainer, and he had been for some time searching high and low for a plan. How cruelly ironic, then, that there on the flight line was, no less, a TG3 built to quarter scale. This, we later established, had been built by Colin Cousins, who, due to poor health, had been steadily selling off his stable of fine models. This was to be a first flight for its new owner and he was therefore well

Gary Bennett's modified Bergfalke makes its maiden flight

The Schweizer TG3 in action

John Lawrence's 1/4 scale Harbinger from the John Watkins plan

Ray Watts' Hangar 9 Decathlon saw plenty of action

pleased when the TG3 soared in fine fashion throughout the day. (Motley keeps giving me a new pencil and sharpener, but I'm refusing the take the hint)

From tug pilot Ray Watts, I heard the following tale of woe. For reasons he refused to specify, he needed a new set of wings for his 1:3.5 scale Wilga tug. He placed the order and waited. Then he waited, and waited some more. As the flying season was upon him, he saw a Hangar Nine Decathlon advertised and set about to convince the missus that the situation could be classed as an emergency. Silver tongued persuader that he is, he obtained the Decathlon, only to be informed a few days later that his Wilga wings were ready and could he please pay the not insubstantial bill!

A few days earlier, at another location, my other pal Smallpiece persuaded me to tow up his diminutive Skylark with his electric Wot 4. It was a strange experience for me, as I had never done any tugging before, but we went ahead and no models were hurt in the making of the programme. Filled with the righteous pride of the newly anointed tugger, I rather incautiously mentioned my heroic exploits on the Scale Soaring UK forum, and it may just be that I exaggerated my part in the proceedings somewhat. The upshot was that Ray offered me his tranny so that I could tow the next customer up, and I had to resort to the old trick of falling over and explaining that I seemed to have a bone in my leg.

Whilst we were in the process of rigging, early in the day, a chap came up to me and said something to the effect 'fancy meeting you again!' Now, I have reached the age

John Lawrence with his 1/4 scale Colin Cousins built TG3

Happy scene in the glider park at Middle Wallop

when I wake up in the morning and remind myself that I'm not 64 anymore, and this is reinforced by the fact that not only can I not remember names, but faces tend to get lost in the fog too! Being steadfastly British, I fell back to saying 'hello mate, how are you?' It was later established that he was in fact Simon Newman, and we had met at the White Sheet scale fly-in where he was maidening his Ventus 2cx, a hair raising experience at the time. He explained that, upon investigation, the model had too much in the way of decalage and some tailplane adjustments were necessary. (It's surprising how often manufactured gliders exhibit this phenomenon.) This was to be his and the model's first aerotow and I'm glad to say it all went without a hitch.

I mentioned Gary Bennett's Bergfalke earlier on and it seemed that he had a surprise back in the car park. For some time now he has been flying a 1:3.5 scale Topaze, from the Traplet plan, and he had been craftily electrifying it. Not for him the simplicity of a mere moustache, he had gone for the Full Monty – an Up & Go. Gary is a systems engineer in the real world and he had readily realised that the metal wing joiner box arrangement on the Topaze made for an ideal attachment point for his improvised Up & Go unit. He demonstrated it working, and assured me that it had successfully flown. All that was left to do was to make a mould of the central wing fairing and cut out the retracting doors. I sincerely hope to see the model in action at the next White Sheet event!

It seemed strange after all these years to have this event squeezed into one day, but with the weather showing its smiley face a good time was had by all. Congratulations must go to the Ghost Squadron boys and girls, and to the tireless tug pilots for their efforts on our behalf, and there are still two more events left to be run...!

Gary Bennett's modified Topaze from the Traplet plan

Author's nearly completed Zugvogel IIIa airframe

Although not fitted with tow releases the E-Bergfalke 4's saw some action at Middle Wallop

CONTACTS
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In The Workshop

I must admit it's getting harder and harder to cast around and find a subject that appeals, and that I haven't done before. Luckily, this time around I found the Scheibe Zugvogel IIIa, a 17 metre single seater that was the precursor to the SF27/ Topaze, of which so far I have built four!

Not surprisingly, the Zugvogel's construction is very similar to that of the Topaze, with a steel tube fuselage featuring a GRP front end and with wooden built-up flying surfaces. This type of fuselage construction is best carried out with the use of a jig, so the 'Bridson' was duly removed from the garage, the scroll saw fired up and off we went.

From the beginning small discrepancies cropped up that could be easily modified on the bench, but less easily on the drawing. So I decided not to produce a plan this time around and freed from this encumbrance, the airframe was mostly completed in seven weeks or so. *(Try not to worry folks, we've heard him say that before! Come on, Chris, your fans are waiting! - KC)*

Once again, faced with the decision to E-assist or not, I couldn't help but remember the delights of E-flying over the summer months with the Bergfalke 4 and the Dart 17, so before you could say Larry LiPo, the motor was fitted in place. Smallpiece came up with a cunning plan this time around to bury the shaft bearing deeper into the solid nose, thus allowing the prop to be removed and all evidence of electricityfication to be hidden. This has yet to be finalised, so we will wait and see. Just a few more jobs to do at the time of writing and then it's out with the covering materials...!

Heard At The Barbed Wire Fence

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I haven't got a sleek, all moulded, aerobatic sailplane...

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Stella Clipper

A 1575 mm wingspan 'Hotliner' glider designed by Brian Austin for four function R/C and a 480KV brushless outrunner motor. Additional pictures by Jeff Ott

This design came about by way of a request by the then editor of R/C Model World, Tony van Geffen, in 2011 for a follow up design to the 'Watts Up' that had proved successful as an introduction to electric glider model. It was made in many versions and used in competition in the 100S class.

At the time I was heavily into other projects, plus I had no clear idea as to what would make another plan feature for the magazine. Time marched on and finding myself at a loose end for a winter project, I contacted Tony as to what he thought might be of interest to readers in this day and age. He suggested that a Hot Liner/Slope Soarer would fit the bill. His other strange request was that it should have a girl's name, hence 'Stella Clipper'. Stella having another meaning, as well of being a celestial connection, sounded just right.

The model design involved going back some 40 plus years for inspiration, to the age when I flew and designed sport power models. The result is quite pleasing without bowing to modern fads in shape that seem to generate from using computers.

It should be within the scope of the average model builder to put together, following the instructions and pictures. The motor used was a Turnigy Glider Drive SK3 Competition Series 3858-4.6 840KV, which at under £30 (currently) are a great buy and have no rotating outer case, with the three connectors exiting the back of the motor. This makes it easy to fit and operate. A Turnigy Plush 80 amp ESC was chosen as fitting the bill for my needs.

I test flew it using a 3S 2650 mAh battery that fitted into the space shown in the pictures. Using a 13" x 7" folding prop the performance was very nice but not startling by any means, but proved the handling to be very pleasant and easy to fly. It is possible to fit a 3-cell 5000 mAh pack in the space provided, coupled with going up on prop size to 13" x 8" or 14" x 9".

If flying from the slope check as to whether you can use electric power from the site, as some do not allow electric driven models. You can, of course, remove the power source and, using a smaller battery, fly it as a pure slope glider, but weight will need to be added to compensate for the weight of the motor, to gain the correct Centre of Gravity position as shown. That said electric power can be useful, if heading down the slope with no lift apparent, to get back, thus saving a long walk.

Construction Begins

With the tail surfaces.

These are relatively straightforward to make. The reason for making them as shown is to save a bit of weight. Cut the outline of the tailplane, elevators, fin and rudder from light 1/16" balsa sheet, as shown. Add the pieces of 3/16" balsa to the edges and the elevator and rudder hinge lines. Infill with 3/32" x 3/16" strips between the edges in geodetic fashion as shown. Add 3/16" sheet infill to areas that will take the control horns, for support.

When done add top 1/16" sheet to complete the assemblies. Round off when complete and add hinge points. I used Robart mini hinge points as they are easy to fit and work well. These are installed after covering. It is best to use white glue to glue them in as it will not gum up the hinge point if it gets in there by mistake.

Building The Wings

These are always the most important part of any aircraft. So do not rush them and your patience will be rewarded.

I built my one upside down, as it's easier to add some of the mounting blocks this way.

You will need some nice straight 1/4" diameter rod, either carbon or metal. I used some Dural/aluminium that I had in the garage. The ribs can be slid onto this, in position. Now cut the top sheeting, slightly over length and width, by say at least 1/8" all round. This should take in the false TE where the ailerons are hinged and allow for the false LE.

Lay over the plan and mark where the 1/4" square spar is glued to the sheeting. Now you can either glue the ribs to the spar (after attaching it to the sheeting) with the rods in, or as I did, glue them in and slide the rods through after they were glued in. I was delighted that the rods slid through with no problem.

At A Glance

MATERIALS:	All wood with metal tube and some carbon
WINGSPAN:	62 in/1575 mm
WING SECTION:	MH42
LENGTH:	45 in/1143 mm
WEIGHT:	55 oz (1540 g) approx.
MOTOR:	Turnigy SK3 Comp Series 3858-4.6 840KV
ESC:	80 amp
PROPELLER:	APC-E 13" x 8" or 14" x 9"
BATTERY:	3S 2500-5000 mAh LiPo

Important Note

The root rib has an angle of two degrees on each wing half, giving four degrees inclusive of dihedral. Pack the wing up, using a piece of scrap sheet 3/32" by 3-4. Hold this on the top surface of the sheeting and bend it so as the sheet contacts the rib surface, then cyano the rib and sheet together. Repeat this for all the ribs both back and front of the spar, so as the assembly is a unit.

Fin and rudder parts

Elevator is built up

3/32" C grain ribs are cut from profiles on the plan

Upper spar is attached to the top sheeting

Ribs are attached to the spar and sheeting, then any excess sheeting is trimmed away

Ribs are glued to the sheet with cyano, rods slid in and the false LE added

Bottom spar added, with webbing and straw tubes glued in for aileron wiring

Block up either end of the wing half with blocks of wood so that the wing is clear of the board, with the 1/4" rods sitting on the blocks to hold it true.

Now add the false LE to the front of the assembly. Slight angles will be needed so as to match the angle of the sheeting. Add straws to take wiring to the aileron servo, where shown, and sheet the rear of servo box area, plus glass or carbon the servo box area of top sheeting so the servo mounts can be glued in. Now add the 1/4" webbing between the spars, but only from the servo area to the centre rib. Add the top 1/4" square spar.

Sand angles on the false LE and TE so the bottom sheeting will follow the wing section, being careful not to sand the ribs.

The bottom sheeting can now be fixed to the assembly with the wing still held on the rods, using a weight at either end to hold it down. Repeat this process for the other wing half. Mark and cut a small aperture where the servo bay is, then enlarge to match the rib and front and rear of the servo bay, after sheet has been fitted.

When happy that all the glue has set the rods can be slid out and excess sheet trimmed from each half. Rebate the ribs at the TE position by 1/8" to accept the TE. This is then glued in using epoxy resin and weighed down until set, flat on board bottom surface down. Sand flat after setting to form the back edge of wing to aileron joint.

The two halves of the wing are now joined by gluing at the centre ribs. Align the ribs to match exactly, then Sellotape the underside at the joint. Apply glue to each rib face, bring together and prop up to maintain the dihedral angle whilst the glue sets.

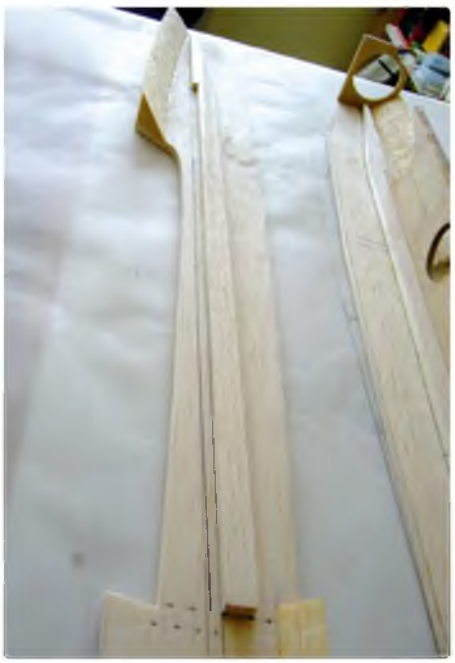
Slide the rods back into the wing halves and place the top of wing face down. Place block under the rods at the tip of each wing to support the wing and pack under the centre, so as the assembly sits firmly on board.

Make up the hold down bolt block that the wing is bolted to the fuselage with from laminations of 1/8" lite-ply and 1/8" balsa, to the shape shown on plan. Drill 5 mm holes and tap M6 in the positions shown. Apply thin cyano to the threads to harden them and re tap afterwards. The holes are transferred to the fuselage at a later time using 5 mm O.D.

Aperture for wing retainer block

Block in position with M6 nylon bolts shown

RH fuselage side with formers in place and ply lamination crutch



Front tri-stock on top, with crutch support and rear bottom tri-stock

Front view of sides during assembly

Sides brought together and rear sub formers in place

tube as a guide for the drill when spotting through. It is easier if you have balsa as the bottom and top laminations, so as to sand to fit the wing contour.

Place into position on the bottom of the wing at the centre joint. Cut out the sheet and ribs so that the block slides into the wing. I reinforced the joint at the centre by using a Dremel cutting disc to cut slots through the webbing at the centre for the first bay each side of the centre. Three slots were cut and .025 carbon sheet was epoxied into position. The block was then epoxied into place.

Add the ply plate to take the rear alignment M5 nylon bolt in rear of wing. This engages in a keyhole slot in the ply lamination crutch in the fuselage. Cut a hole to access the servo leads where they exit from straws to the Rx.

Ailerons need to be from good stiff quarter C grain stock. They are tack glued with balsa cement to the rear of the wing, with the wing half bottom-side down on the board.

It would be beneficial to cover the bottom of the ailerons with lightweight glass cloth as the TE is very thin. This lets the bottom of the aileron follow the bottom surface of the wing. These run from the centre to the tip each side (half), to include the fixed pieces that do not move in the centre of wing. It is beneficial to remove a fair amount of the aileron top angle before gluing to the wing for final shaping.

After shaping, remove from the wing and cut the ailerons to allow the centre pieces to be glued permanently into position. The ailerons themselves are angled so as to allow them to be hinged on the bottom with Oracover, giving approximately 35-40 degrees of up movement.

Add tip blocks from soft balsa and shape as shown.

Building The Fuselage

Make up the crutch from two laminations of 1/16" ply, with carbon cloth sandwich between the layers. Epoxy together and leave to set. Cut holes for the ESC wires and servo wires as shown, plus a keyhole slot for the M5 nylon bolt alignment in the wing. Hold down M6 bolt holes are cut later with the wing in position.

Sides joined up and top front sheet added

Ply for front hatch screw can be seen at the bottom of this shot

Rear top sheet is glued and shaped to match the sides of the formers before adding the balsa sides

Front hatch in position

Motor in position

Rudder and elevator servos are shown side mounted and angled to follow the pushrods

Cut all formers out. Drill the front former for mounting holes to suit the motor. There is an additional former that is glued to the back of the motor mount former. This is cut away to take the taper on the nose of the motor. The former at the rear of the wing, that is the back of the canopy, is cut through at the junction of the crutch position. This can be added after the top is glued to the crutch.

Cut sides out to the plan and mark the position of the formers and the crutch, right and left handed. Add the 3/4" quartering at the front top and 3/8" quartering on the bottom aft of the wing. Cut piece of 3/16" sheet to fit where the crutch will sit, for both sides.

Now do a dry run, placing the front former, crutch and former at the rear of the wing (top half). Clamp together and check that the rear ends come together, after tapering off the bottom quartering strips to allow the ends to meet and line up. If okay they can be glued into position.

Add 3/16" sheet doublers where shown at the front and ply cross piece to take the hatch retaining screw at the front battery hatch. The front battery access hatch is held at the front by a piece of lite-ply that goes under the lower sheet at the motor position and is held with a screw into the lite-ply at the rear. The rear of this hatch is angled as shown, which has a corresponding angle on the hatch under the wing. This retains the front of the wing hatch, with a screw into a lite-ply piece on the former at the back of the wing, as shown. This hatch has curvature to match the sides, so this needs to be sanded to fit the fuselage sides. Both hatches have 1/8" square strips on the inside so as to hold them laterally from moving. Small pieces of lite-ply are let into the hatches for the screw heads to sit on, as shown.

Sand hatches to blend in on the outer faces. Add top sheeting on the nose and radius off to match the spinner radius.

Add the two formers behind the wing that form the rear decking. Add a piece of scrap behind the rear wing former to stiffen sheet sides. Cut piece of 3/8" sheet for the top of the rear deck and angle the sides to match the formers. Now add the 1/8" soft sheet side decking. Soaking the outside with a sponge will aid the curvature whilst gluing it in position. Radius the top off when done. The bottom sheet at the rear can now be glued on, with a hole to let air exit.

The wing bolt holes in the crutch can now be spotted through from the wing, when positioned on the fuselage. Slide a couple of 5 mm O.D. tubes (brass or aluminium) down

the M6 tapped holes in the wing. This will stop the threads being damaged whilst spotting through. Remove the wing and drill M6 clearance holes in the crutch. Screw the wing on and glue the tailplane and fin into position, add fairings either side of the fin, then blend in. Make sure the tail and fin are square to the wing. The Mark 1 eyeball is pretty good for this sort of thing, I have found over time.

The fairing over the wing can be added now and the canopy fitted on a dry run. This is fitted after covering, or before if you wish. Sand the fuselage to give a rounded shape where appropriate.

Fitting The Gear

Work out as to how you want the servos for the elevator and rudder to be positioned and work out the angles for them to cross over each other without fouling. I used 5/32" carbon tube for the pushrods as they take less room and the 2 mm pushrods can be cyanoed into the tubes. You might need to open the hole in the tube to take 2 mm rod. Turnigy 245MG servos were used, covered in clear heat shrink and glued on their sides at an angle as shown in the pictures close by.

The wing servos are straightforward and drive the ailerons via horns exiting the bottom of the ailerons. The horns are reversed as to normal, with the sloping side to the front to aid the flap action.

I did arrange on my version for the ailerons to act as flaperons when moving from half down to full down position. They worked as a drag flap rather than an aileron, i.e. the down going aileron dragged the model in a turn rather than going up to bank the wing down. It so happened that the model slowed down enough with 50% down and still had control.

Flying

Check the model for the correct balance point using the position shown on the plan as a guide. Arrange for differential on the ailerons of 2/3 up and 1/3 down. All other controls are set for the pilot's personal liking.

The crow type aileron needs no more than 50% travel down and is still controllable. Ask a friend to launch the model for its first flights so that you have full control at all times. The original was viceless so it should suit most flyers.

Now enjoy your Stella Clipper! ***RCMW***

Finished and ready to fly, Brian Austin holds up his latest 'hotliner' design

Camera flypast using flaperons

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Email: b_austin@talktalk.net

Stella Clipper has an excellent rate of climb

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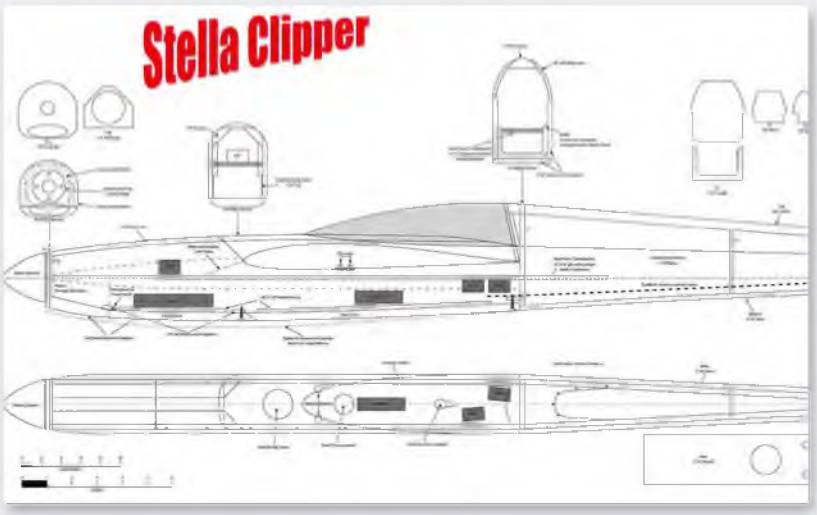

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Andreasson BA-4B

Enjoy building Roger Vaughan's 3S electric sport scale biplane from this month's free pull-out plan

RC MODEL WORLD

At A Glance

NAME:	Andreasson BA-4B
MATERIALS:	Balsa and plywood
WINGSPAN:	37 in
WING AREA:	360 sq in
ALL-UP-WEIGHT:	38 oz
WING LOADING:	15.2 oz/sq ft
FUNCTIONS:	Aileron, rudder, elevator, throttle
MOTOR:	A2212/13 1000KV outrunner
ESC:	40 amp
BATTERY:	3S 2200 mAh LiPo
PROPELLER:	9" x 4.5" APC-E

The little BA-4B will loop and roll, but looks best when stooging around in a scale-like fashion

The full size BA-4B was designed by Bjorn Andreasson as a potential project for home builders. It first flew in 1966. Its predecessor, the BA-4, had a traditional wooden structure. The revised, all metal, BA-4B may have put some home builders off, for only a few were ever built. However, Bjorn's design has always been a favourite with scale modellers.

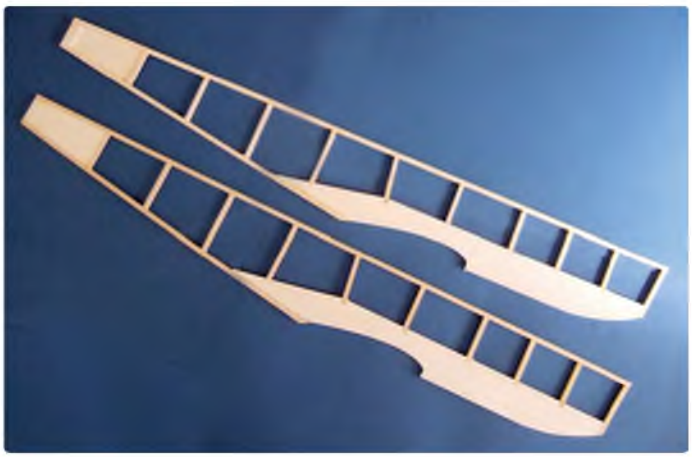
Back in the sixties I built Walt Mooney's Peanut Scale version and loved its compact lines and stable flying qualities. Recently, I began to think that a radio control sports scale model would make a fitting companion to my Isaacs Fury, which was built to the same scale and published in the November 2011 issue of R/C Model World, and which is still going strong (Traplet plan number MW3116).

There are no rigging wires on the full size BA-4B and this little 37 inch span model can be assembled quickly and easily. Trying to reproduce the all-metal construction of the original aircraft with 1/16" sheet covered wings, etc. on a comparatively small model would probably produce weight problems – hence my 'Sport Scale' version. Although not for the beginner, a radio-control flyer who has built a few models from plans should have little difficulty with this one.

Tail Surfaces

Starting with the simple tail surfaces gets the first part of the build completed and will encourage you to move on to the fuselage. The tailplane and fin are made of 1/4" medium hard balsa.

After the basic structure is complete the rudder and trailing edge of the tailplane are sanded to a taper and the leading edges rounded. Note the elevator is kept in one piece while the 18 SWG joiner is fitted. The centre cut out is only done just before fitting to the fuselage to ensure that it follows the rear fuselage profile. I centre hinged and pegged the movable surfaces and made them secure with hard balsa dowels.



Basic fuselage sides

F3 and F5 fitted to fuselage sides

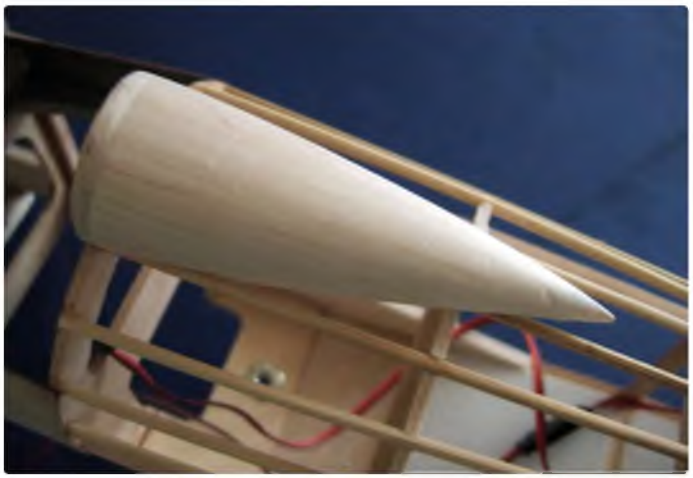
F5 with cabane struts ready for securing with thread and epoxy glue

Lite-ply cockpit rear former. The bottom cross piece is removed later

Rear formers and BBQ skewer stringers in place

3 mm ply F1 fitted

Nose block and cowl shaped from medium/soft balsa sheet. Laminate if necessary



Cockpit head rest fairing in place

Head rest and tailplane fairings are from blue foam with thin balsa coverings

Motor mounting

Battery box fitted

Fuselage

The basic sides are constructed from medium/hard 3/16" balsa. Top quality 1/8" ply was chosen for the two main formers (F4 and F5) and then the cabane struts, and U/C wires (on F4) were attached. The sides are brought together using F3 and F5. When all is square the sides are joined at the rear post. Leave F4 unfitted at this point as the undercarriage wires obstruct putting the base of the fuselage on the bench whilst lining everything up.

Now fit the 1/8" ply nose former F1. The cowling sides are simply light balsa block or blue foam sanded to shape. The same simple method is used for the removable cowl top and fixed base. Finally, add the nose block and sand the cowl to finished shape. You could cover the entire cowl with aluminium foil or 1/64" ply with the rear curved outline back beyond F3. However, on this prototype model a one and a quarter inch strip of 1 mm ply, with the rear curved edges shaped, was stuck to the rear of the cowl block. The front edge was sanded as thin as possible and any ridge at the front was hidden with lightweight filler. This is marked with a dotted outline on the plan.

Turning to the rear of the fuselage, fit F8-F12 and 3/16" square cross members. The nine stringers were made from bamboo BBQ sticks. After fitting, the formers were relieved between the stringers. The two rear side panels of the fuselage were sheeted, to provide support for the 9 gram servos, which operate the tail surfaces. I filled the underside panels with 6 mm Depron sheet for strength, with the exception of the 3/16" sheet balsa rearmost section, which carries the 1/8" ply tail wheel support.

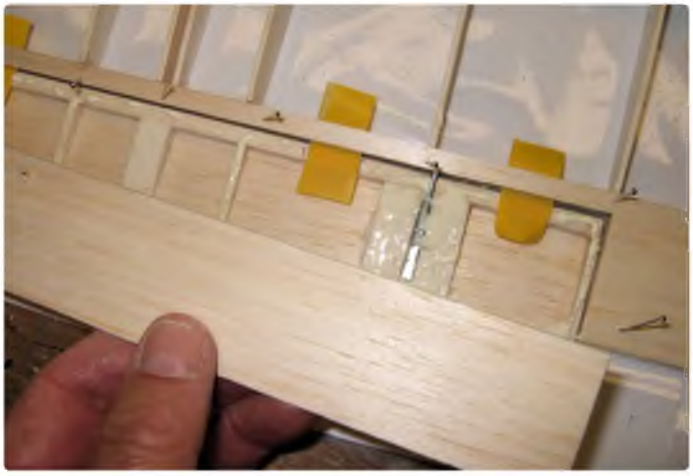
Next add the U/C former F4 and solder the wire diagonal brace between the cabane struts. The struts are then sandwiched between two layers of 1/16" x 1/4" balsa and sanded to a streamlined cross section.

Instrument panel. Details are shown on the plan

Upper wing central section base plate

Upper wing centre section ready for top sheeting

Building a lower wing



Solartex strips used for aileron hinges are secured with small balsa pegs

Lower wing centre section and aileron servo

Note the slight gap just above the top fuselage stringer line. This enables the struts to be moved outwards when rigging the model. The 1/16" top front sheeting and 1 mm ply cockpit sides can now be fitted.

Fuselage Fittings

With the basic fuselage complete it is now time to add important fittings. A battery box is made and slid into position through the square hole in F3, and two hardwood blocks with captive 3 mm bolts are glued to the rear of F1. These are arranged so that when the motor mount F2 is added the motor is in its correct position. Now add the lower 1/8" ply wing fixing formers F6 and F7.

Four inches of 18 SWG brass tube was soldered to a half inch strip of brass shim. This was cut into 3/4" lengths to receive the wire ends of the wing struts. Two of these are glued with Araldite to the fuselage sides just in front of F4.

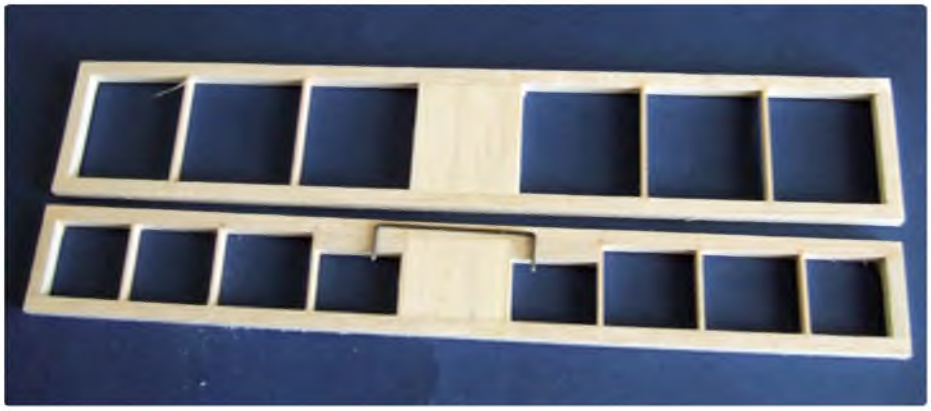
The top of the cowl is secured at the front by a small dowel, which is inserted into a hole in F1. The cowl is retained at the rear with a 3 mm bolt going into a captive nut on a small block at the front of F3.

Add the headrest, undercarriage fairings and the scale blisters that help to locate the cowl top securely in position. It is worth spending time on the dashboard and pictures of the real aircraft's fascia are available on the internet.

Upper Centre Section

The 1/8" lite-ply base is the foundation of this structure and the placing of the mounting tubes is key to ultimate accuracy of the overall aircraft structure.

Bind the tubes to the base plate and test fit to the fuselage cabane struts. When absolutely satisfied that all is square and at the correct angle of incidence, glue the tubes to the base with Araldite and leave to set thoroughly overnight. Alternatively, bind with thin copper wire and solder.



Tailplane and fin/rudder are framed using 1/4" balsa, with 1/4" x 1/16" ribs

The BA-4B is assembled and ready to apply the covering

A short while later the little bipe is covered in a bright scheme and ready to fly

Glue to the topside of the plate ribs R3, the 3/16" main spar, 1/2" leading edge and the 1/16" ply dihedral brace. The 1/16" top sheeting is added after top wings have been fitted.

Lower Centre Section

This is of similar construction to its larger upper wing brother. The centre ribs R2a are spaced to suit the width of your wing servo. The rear trailing edge is built up with 3/16" soft block and the two front fixing dowels added. Once again, final sheet top covering is left until the wings are attached and the actuating rods in position.

Wing Panels

The four wing panels are the same basic simple structure. The ten ribs in each panel are identical and made by the 'sandwich method' from 1/16" medium balsa. The centre rib is 3/16" and is added when the dihedral angle is set.

Pieces of 6 mm Depron are fitted between the main spars. I find this a strong, light and convenient method of webbing. The sheeted trailing edge is built up using riblets 1b, cut from complete ribs. Small blocks of the same section support the small 1/16" ply aileron joiner rod tabs. The 1/8" gap between the two wing interplane strut support ribs is filled on the top of the upper wing and on the underside of the lower wing, to prevent the struts piercing the covering. For strength the spaces between these and the adjoining ribs are sheeted with 1/16" cross grained balsa sheet. This provides a firm three-sided box to house the interplane strut tags when the model is finally assembled.

Three view drawings of the full size aircraft reveal that the wingtips are built flush with the top surface of the wing. Very soft balsa block or blue foam could be used. My Andreasson biplane had tips from blue foam, covered on the top surface with soft 1/8" balsa. This made shaping the upwards taper on the underside towards the tip easier to produce, whilst accurately following the wing top surface profile.

Setting Up The Wings

Before fitting the top trailing edge sheeting on the bottom wings fit the actuating rods and cut out the aileron section. Hinge material was placed on top of the spars and then the top trailing edge sheeting was added. This provided an effective way of top hinging the moving surfaces. The process is similar for the upper wings but without the complication of the servo actuating rods.

The completed wings are joined to their respective centre section with the appropriate dihedral at the tip ribs – 1" on the lower wings and 3/4" for the top ones. This is easily done by propping up the tips at the right height and then sanding the 3/16" root ribs till the mating surfaces with the centre section ribs are vertical. It is then a simple matter to fix the appropriate dihedral braces into the wings and cover the leading edge and top surfaces of the centre sections. Sand everything smooth ready for covering.

Strutting About

The main wing struts are simply constructed from two laminations of hard 1/16" balsa with the 20 SWG wire strut ends sandwiched in between. The interplane struts are similar but have triangular laminated 1/32" balsa fairings added to the rear edge. You will see from the plan that 'tabs' are included to fit into the slots prepared between wing ribs. These tabs have to be bent to allow for the slope on the interplane ribs and I reinforced this bend with shim aluminium between the laminations.

Setting Up

With the uncovered model assembled you can make the aileron rod joiners and fit the wing and interplane struts, checking that all is square and lined up correctly. The ESC fits neatly under the battery box. The rudder and elevator servos are mounted on the rear fuselage sides, with the wing servo (which could be slightly bigger and more powerful) between the centre ribs of the lower wing centre section.

For covering I used Solite to save weight, but if I ever have to recover the model I will go for a less transparent material like Solarfilm.

Power

Once again I took the advice of Anthony Hill at All Electric Models and fitted a A2212/13 1000KV Suppo motor driving a 9" x 4.5" APC-E propeller. This combination has given ample power for all the test flights using a 3S 2000 mAh LiPo battery pack.

Flying

The small two and a half inch wheels tend to dig into grass strips on take-off. The answer was to select almost full power and go for it, with a little right rudder to counteract the torque at the start of the run. Once airborne the little BA-4B behaved well and really looked the part.

The stall was not vicious but gave little preliminary warning; power on and recovery was instant. However, this tendency did catch me out on one landing approach. Biplanes offer a lot of drag and a power off descent, which started off beautifully, became an almost vertical drop for the final three feet or so as the BA-4B slowed down and stalled in. The moral is always land with some power on to keep the speed above the stall mark.

Eventually the right conditions arrived for the flying shots. Andy Stone did an excellent job with his camera and helpful club mates left the sky clear for the photo call flight in superb weather conditions. They were impressed with the flying qualities and Andy and I returned home, relieved to get the shots in the can.

In terms of aerobatics the model has performed simple loops and rolls. However, I prefer to stooge around the strip just admiring how she looks. Scale-like flying is the order of the day for me.

At present the rates that suit my conservative flying style are:

Aileron
Low - 1/4" each way; High - 1/2" each way
Rudder
Low - 1/2" each way; High - 3/4" each way
Elevator
Low - 3/4" each way; High - 1" each way

All have 35% exponential. The rudder is 32% coupled to aileron.

However, I am sure you will find the settings that suit your style and will probably be much more adventurous than I am.

Conclusions

As I have already said this is not a model for a novice but it would make a good building project for more experienced builders to create on those days when autumn and winter weather precludes flying.

Hopefully, when the days lengthen, there will be many little BA-4B's cavorting around your flying field skies.

RCMW

Scale-like flying is the order of the day. Our thanks go to Andy Stone for taking the in-flight pictures

Remember to keep some power on for landing!

On a steady climb out

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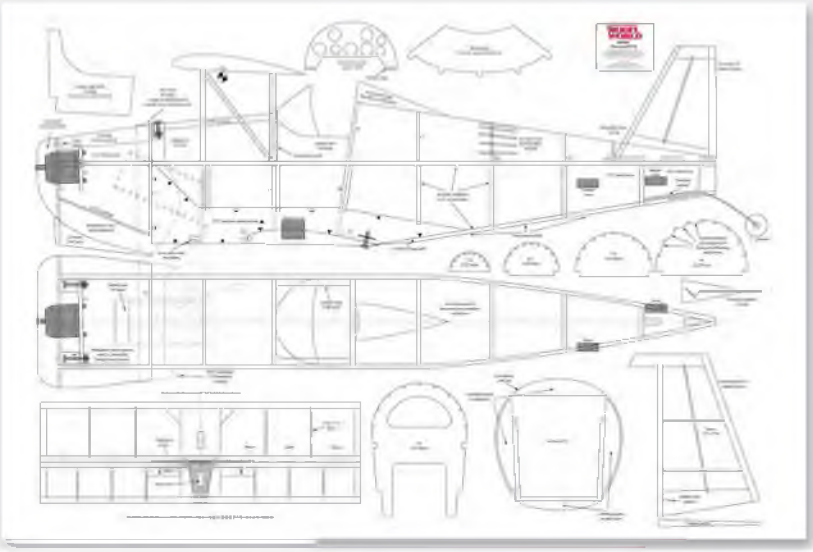

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Soarers' Slot

Although kept very busy as Contest Director, Mike Proctor also had his camera and notepad close to hand to record the action at the Wetlands round of the BMFA Silent Flight Nationals

Gary Peck, a newcomer to electric soaring, flew his AVA in Open eSoaring. One of three such models in the contest

Having lost Barkston Heath and with it RAF Cranwell, where BMFA Silent Flight events had been held previously, the hunt had been on for some months to locate a venue where all SF competitions could be held at one place. Several potential locations were investigated but all fell at the last ditch.

The eventual outcome was that four competitions were held together, over the Bank Holiday, at Wetlands near Retford, and these were the ones I was involved with. The remaining four classes were run at separate times and venues and we may have more on them next time.

As usual the weather forecast changed significantly during the preceding week, but for once it was getting generally better! The rain was predicted to be at its worse on Saturday for the F5J competition but despite a solid overcast and threatening darker clouds approaching from *downwind* the competition was completed.

F5J Class

This was the best attended competition with 26 entrants. In this class competitors are required to do a 10 minute precision flight from a start altitude of their choosing. The higher the start, the more points are deducted from the flight score total, so the lower the launch the better, provided you can fly out the 10 minutes!

Round 1 was flown in dead conditions with any lift being very light; it was a question of choosing a height from which you thought your plane could manage 10 minutes. Most people launched above 150 m but the 'new breed' of lightweight soarers were made for these conditions and Pete Mitchell launched to 120 m with his 1100 g 4m Ultima, then cruised for 10 minutes to win. Generally speaking, those flying lighter models did well in the first round. Amazingly, two people landed out in Round 1, receiving zero scores.

Ian Duff won F5J by 3 points in 4000! Here seen returning to the pits with his Ultima, super lightweight which proved useful in early rounds

A cross section of models waiting for their turn to fly in F5J; various colours and tail configurations to be found but V tails are generally on the way out

Graham Wicks with his Maxa in F5J. Suffered a missed flight when his logger was full and failed to provide a height reading – see text

Not a common sight but this 'Thermal Instinct', 2.65 m span, is available as an excellent kit, with everything cut, from Hollein. Flown in F5J and Open eSoaring by Stephen Mettam

If you want to maximise your 10 minute allocation you need to get cracking the instant the horn sounds. This is a point in the flight where considerable care is needed and competitors were required to fly straight for a minimum of five seconds

In Round 2 a zero score for launching before the start signal was recorded, as was another when no height reading was recorded at the completion of the flight. It was becoming increasingly obvious at this time that things would be close at the top and flyers were beginning to fly as close to the slot end as possible, with the result that two overflew the end and lost their landing points. During Round 2 about 45 minutes were lost to rain.

Round 3 produced some very variable scores. Graham Wicks had outflown all others but on landing could not produce a reading from his logger and received a zero score. In fact he later discovered that the logger was full from previous flights and he had failed to tick the 'overwrite old files' box; clearing the logger before each competition is recommended. In Group 4 only one landing bonus was recorded!

Round 4 had lots of happenings, starting with Bill Haley having a servo on his Explorer wind round on launch, to give 'up'. This resulted in an interesting couple of minutes after which stable control was established, following early aerobatics, and the model landed safely after some very good piloting.

In other places points were lost (zero) for motor re-start on landing approach, a 100 point penalty was given for running a motor before the start signal, and there were several over flies. Clearly, the sky threatening more rain and the approach of the final round was causing people to push things to and, in some cases beyond, the limit.

Round 5 was unfortunately curtailed half way through at 4:30 pm due to the rain restarting. Hoping to be able to get the remaining two slots flown we waited half an hour then declared the competition over. In fact it rained for four hours! Four rounds being a minimum number for an F5J event, we had a result and completed the prize-giving in a well packed event shelter. All in all we were lucky to have so much flying time.

It became clear during this competition that despite the fact that other logger settings are currently allowed in UK F5J events (principally to allow motor restart) they are not the best way to proceed and full F5J firmware (no re-start available) should be the norm in future.

2 Metre eSoaring

The following day, Sunday, was for 2 metre eSoaring. This was held on a different field, requiring the stout party to head about half a mile through the morning mist for the plateau at Wetlands. Although we had only gone upwards a very few metres, the cloud base looked considerably nearer than it had before! This low cloud seemed to confirm the weather forecast, which was for as much as three hours of rain over the midday period.

Retro rules! Mike Holtby made his debut in F5J with this Calypso Contest V Electro (F3B version). The last part, the 'Electro nose cone' was only completed two days before the Nats. Further upgrades, including increasing the span to 3.3 m and incorporating a fixed nose cone, are in development!

Steve Haley flew very well during the SF Nats, coming 2nd in F5J and 1st in both 2 m and Open. Certainly looks happier than the miserable CD – it had been a long day, or so I tell everybody!

Another super day, making three days of flyable weather and evening BBQs at an SF Nats. First time for a few years that we have not lost a day. Brian Johnson and Phil Brandreth both have mainly black models for visibility but they need covering up when not flying, to prevent rapid heat build-up

Brian Johnson flew this Highlight Speed, also known as a Nellie, in 2 m eSoaring! Originally with full span ailerons, now converted to flaps/ailerons and about 7 degrees of dihedral. Getting the C of G in the right place is an ongoing process! Now known as Nellie the Elephant, although it goes up in lift well for such a beast!

No rain was evident and a good few cautious test flights were made to test the visibility, which was too close to 200 m to allow the competition to be started. But it did provide a useful interlude during which the CD went back and collected the speakers he had forgotten! When I got back, about 20 minutes later, the sky was much clearer and the first of the planned seven rounds was soon underway.

2 metre models provide a good, cost effective way into eSoaring competition and there are an ever increasing number of models available. This class is also the one which keeps home builders and designers busy producing quite competitive models. 2 m rules are the same as for Open eSoaring, with the exception of an increase in the motor run allowance from 30 to 40 seconds. Originally this was introduced to allow low powered RTF foamies enough time to climb to the cut-off height of 200 m. However, as replacement motors are plentiful, powerful and available in a wide variety of winds, re-motoring to enable climbing to height within 30 seconds is a fairly easy option for most, if a simple increase in prop size will not suffice.

Setting up for a 30 second climb has the considerable advantage of giving the model more penetration during the climb and thus being able to achieve a good position upwind.

As it happened, this particular day was near perfect for 2 m soaring, comprising mainly light lift with light winds and no rain. Being light, the lift took some finding and several slots were won with sub 10 minute scores. Being blessed with light winds made downwind lift searching much more of an option that many were willing to take and some very good 'saves' were made in this way.

One of the tactical points when flying 2 m is to make an early decision, if the conditions are poor, to take a re-launch and hope for better air in the second half of the 11 minute slot. This can work well, or can go horribly wrong, with the second (scoring) flight being in even worse air than the first one! Just as bad is the mediocre first flight with a good landing, which gets replaced with a slightly better flight with no landing bonus. Not a choice for the tentative!

The competition itself was a close fought battle between quite a few people and it was all down to the last flight. After seven rounds, Steve Haley beat George Wells by 25 points in 7000; both flew Q12s. Gordon Brown flew his home built as usual to a very secure 3rd place.

One other aspect of the day was the antisocial behaviour of the downwind poplar trees. On no less than two occasions these blighters made successful grabs at innocent passing models, capturing one in the higher branches and another at about the halfway point. The high one was well and truly caught in the spindly branches, about seven metres high, and looked like it would need serious equipment to retrieve it. The second, in the lower branches of a similar tree, was persuaded to return to earth by judicious use of the throttle to swing it loose. Being one of the very few models using 35 MHz radio the actual 'catch' had been between the branch and the aerial wire and this eventually succumbed to the see-sawing motion caused by motor on/off commands. The only damage was to the aerial!

What of the higher problem? It happened that one of our number had the phone number of a tree surgeon, who appeared with his 'climber' the next morning. Those

George Wells dispatches one of the Scottish contingent's many Q12s ('Sapphire' in some places and also in V tail form), which were popular in 2 m. George placed 2nd in this event

Phil Brandreth produced this very well made Miles for 2 m. The general ambience of the model was marred on occasion by the motor sounding like a cement mixer full of dry gravel! Fortunately, things improved later

The East Anglian wanderers appeared yet again and had a good weekend. This time Russell Mexome helps John Hovell fly his Omega, all-moulded model, in 2 m

Bob Dickenson came very close to winning Open eSoaring, missing out by 9 points in 6000! Here he is helped by Bill Haley, as he prepares to fly his Optimus

who saw the retrieve could only marvel the skill and daring displayed. Using climbing leg-irons, he swarmed up the tree, declaring it, "A bit bendy up here!", and took hold of the model. They both returned to earth unscathed!

Open eSoaring

Saturday evening was spent back at the campsite in the lower field, where cooking a meal, contemplating the Open eSoaring competition the next day or just re-running the events of the day continued long into the night.

Sunday was the day with the best weather forecast – light wind, warm, no rain – but would it turn out as predicted? Yes it did, providing us with a fine day for soaring in very testing conditions.

From the start of Round 1, when everybody scored near to 10 minutes, you would have thought that it was going to be easy, in what looked like conditions of abundant light lift. But you would have been wrong!

In the two remaining slots of Round 1 only three 10 minute times were recorded, 7 minutes being a good flight for all the others.

Round 2 was much the same, slot 1 scoring well; slot 2 had a couple of 10's but slot 3 was a downer! Nearly all the flight times were in the 5:30 second range and several relaunched, failing to manage even that! The conditions reversed somewhat in Round 3, where the first two slots had low scores and last one was good. By the end of Round 3 it was clear that there was a two-way battle for 1st and 2nd developing between Steve Haley and Bob Dickenson, and another for 3rd and 4th between Ian Coutts and Rick Lloyd.

Little did we realise at the start of Round 4 that 'battle' was the right word! Steve and Bob were in the first slot and both of them were struggling with light lift over the downwind tree line when the collision occurred. As is so often the case one model was badly damaged and the other was barely scratched! Steve's lightweight Pike Perfection suffered a broken wing panel and its joiner; the connected remnants 'landed' behind the trees, where they were eventually located, just before the comp finished.

Bob was now in the driving seat, as Steve would need to continue with perfect scores to have a chance of winning. Amazingly, from this point early in Round 4, only four 10 min flights were recorded by the end of Round 6. Ian was in a secure 3rd place but Rick had dropped back, with equipment problems causing missed flights.

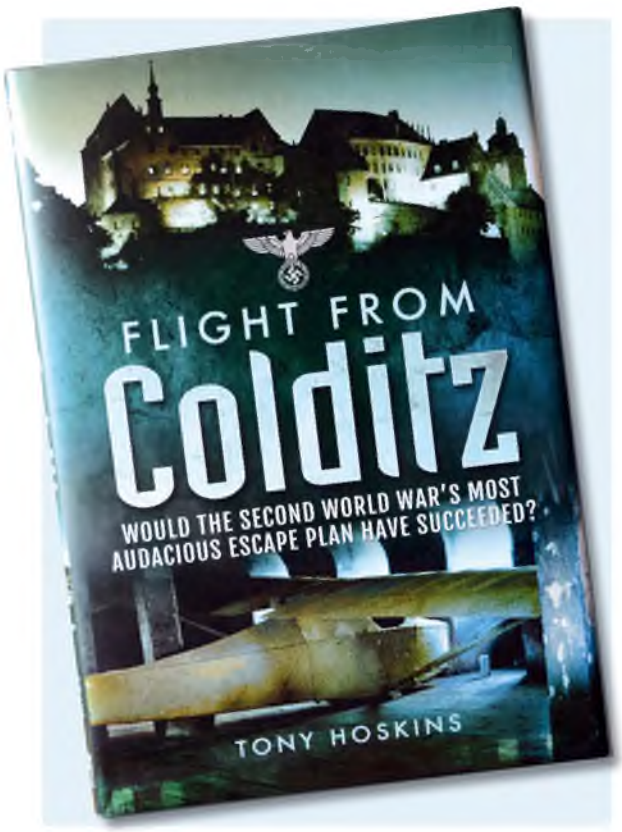
So at the start of Round 7 there was a lot at stake! Both Bob and Steve had a dropped round (worst score so far) of 998.5! If they both scored 1000 on their last flight, Bob would win on the count back (Steve having a zero in Round 4). Steve flew in slot 1 and recorded a perfect score of 10 minutes, plus 50 points for landing, in an otherwise poor slot. Bob flew in slot 2, doing 7.40, but struggling for lift downwind he was unable to get a landing bonus. Most of the others however scored around 6 minutes, except for Martyn Wharrie who had quietly thermalled away in his own bit of very light lift, scoring 9.33 to easily win the slot and secure 4th place overall, leaving Steve the winner by a mere 9 points in 6000, over Bob!

All agreed that it had been a good competition and, despite the rain, the 2016 BMFA Silent Flight Nats had enjoyed the most flyable three days for some years.

RCMW

In Print

Here's a pair of worthy additions to any aeromodeller's literary collection



Flight From Colditz

By Tony Hoskins
Frontline Books, 168 pages
978-1-47384-854-2
Hardback, £19.99

Television programmes that feature R/C aircraft are quite rare, so when one comes along it tends to stick in the mind for quite a while. One such TV documentary, filmed in 2012, covered the remarkable story of the Colditz Cock glider, built by POWs in the roof of Oflag IV-C, better known as Colditz Castle. Besides recalling the background to the planned escape of a pilot and passenger, sitting back to back in the parasol wing glider, the production company also commissioned a replica aircraft to be built, which was to be catapulted from the roof of the castle to see if the daring escape plan would have worked.

The author of this highly entertaining book, Tony Hoskins, who runs a company performing wood and fabric restorations on vintage aircraft, was tasked with building the flying replica. In the first half of his book, Tony covers the background story of the Colditz Cock, which was built after one of the prisoners noticed that falling snow was being swept over the roof of the castle, clearly showing the presence of slope lift. A plan was hatched to construct a glider to carry two escapees across to a field on the far side of the River Mulde. Information on aircraft design was gleaned from a book found in the castle library and a workshop was established by partitioning off the garret above the British sleeping quarters with a false wall.

The glider was constructed using handmade tools, and using wood from floor and bed boards. A remarkable 6,000 pieces were used in its assembly and it was covered in the blue check material taken from the prisoners' mattress covers. When complete it was intended to be catapult launched from a trolley propelled by a falling bathtub full of concrete and rubble. The ensuing noise as the tub hit the ground was hoped to be disguised by bomb blasts during an air raid on nearby Berlin or Leipzig. A model glider was even made to test the design – it flew well and landed at the feet of a guard!

Although construction started on the glider in 1944, the castle was liberated in April 1945 so the design of the glider was never put to the test. But despite never being flown it served well to keep up morale and it also helped to keep the minds of the POWs active and engaged during their long incarceration. Unfortunately the original glider was believed to have been broken up for firewood, but the rudder was preserved in the local museum.

The second half of the book covers the construction of the replica machines. Two were required, one being built to fly using radio control, and the other to be built in the castle attic to show the construction of the aircraft in the actual roof-space of the modern day castle. The replica aircraft benefited from CAD plans and CNC cut components, but many bureaucratic and technical obstacles had to be overcome before the R/C replica could be launched from the castle, not least perfecting the launch mechanism and dealing with large amounts of adverse yaw generated by the large ailerons and the inefficient rudder.

The one off flight was successful and the glider reached the intended landing site on the far side of the river. But it was actually badly damaged on launch, when the release mechanism entered the rear fuselage and took out some diagonal cross braces, weakening the rear fuselage, which twisted in flight. The aircraft eventually regained level flight and managed to glide to the landing field, but it pitched down and suffered more damage from the resultant heavy arrival. The build replica can now be seen at the Glider Heritage Centre, Lasham.

This book is highly recommended as it contains a good mix of wartime and aviation history, plus an insight into modern aircraft restoration and construction practices, blended together with a large dose of radio control interest. The perfect mix for any aviation minded R/C enthusiast!

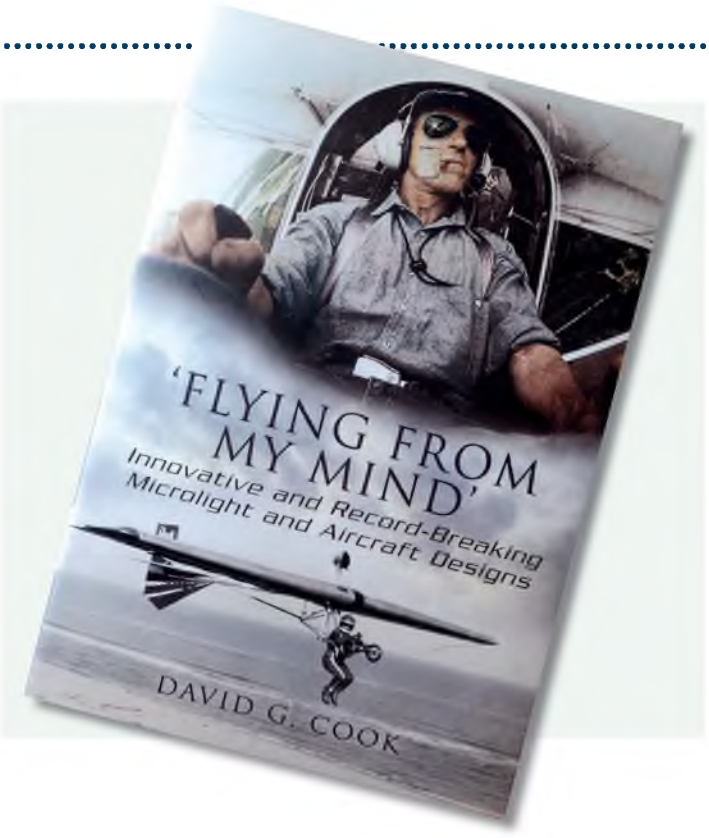
Flying From My Mind

By David G Cook
Pen & Sword Aviation, 228 pages
978-1-84415-588-0
Hardback, £19.99

Back in the 1980s a member of the Maidstone MFC, the club at which the Editor started his model flying career, began the construction of a microlight. Various small pieces, including parts of the tailplane, appeared at club evenings and drew lots of attention. The aircraft in question was a Shadow (if my memory is correct!), so the arrival of this book in the editorial office, written by the designer of the microlight, brought back lots of happy memories from my time with the MMFC. I wonder if that aeroplane ever did get finished and flew successfully?

In his memoir, David Cook, who was a top national and international hang glider pilot in the mid 1970s, describes how he built a power unit for his VJ-23 glider and then developed the idea to cross the English Channel, the lowest powered aircraft ever to do so at that time. The VJ-23 series featured an unusual configuration for a hang glider, having relatively straight wings with a slight taper and a cross configuration tail mounted on a long boom. The design evolved into a Demoiselle style microlight, before eventually becoming the familiar 'pod and boom' style aircraft that we associate with the CFM Shadow series of aeroplanes. The book goes on to relate David's travels around the globe demonstrating the Shadow and Shadow Streak, and setting world speed, distance and altitude records along the way.

A highly entertaining read, albeit with a sad footnote at the end regarding this most recognisable of microlight aeroplanes, which ceased production following the issue of two CAA Airworthiness Directives.



One of the two 30% scale Boeing Stearman biplanes Richard Rawle has built and displays with, alongside Steve Holland

LMA At Cosford

Neil Hutchinson reports from the flight-line at the Large Model Association's big rally, held on 16 - 17th July, 2016

Dean Coxon flew his new Hangar 9 Extra 300 fitted with a DA 120 cc petrol engine

Dave Johnson put on another superb display with his 1/3rd scale English Electric Lightning. The 7 ft 8 in wingspan Lightning took Ted Allison four years to build

Ever think you've upset the weather god's? I think I must have! Cosford was the second show in a row and again I could only make it there for one day, on the Saturday. The weather was overcast and cool. Sunday, when I wasn't there, it was glorious!

I arrived at Cosford wondering if there would be any changes to the layout of the show line. Last year there were problems for the traders in the way they had been positioned in relation to the flight line. This year it all looked more like the usual LMA show layout and I'm sure everyone was a lot happier. The LMA team do a lot of work prior to events like Cosford to ensure everyone gets the best experience possible and it's good to see it pay off.

The show had a good mixture of models as usual. It was good to see some old faces that I hadn't seen for some time, too. As I walked over to the flight line I saw two huge orange Boeing Stearman biplanes and a large 1/3rd scale replica of the Caroline Grace Spitfire, ML407, so I knew Richard Rawle wouldn't be far away.

Richard doesn't do so many large shows now, so it's great to see him and his superb models. The Stearman biplanes are in the Breitling team colours. Richard flies a superb display routine along with Steve Holland (second Stearman pilot) and Sharon Stiles, who operates the wing walkers.

Robbie Skipton was there, too, with his huge Pitts Challenger aerobatic model. Unfortunately, Robbie's Pitts had a terminal crash, caused by engine failure, on Sunday. It seems more than a little ironic that this time last year, Robbie demonstrated the Pitts for the first time and that 2016 was the model's last show. Gerhard Reinsch made the trip from Germany again. Gerhard put on a superb display of aerobatics with his big Eindecker.

Above & below left: The massive 2.2 m wingspan MiG 29 owned and flown by Neil Hyde. The MiG has two AJJ 170 turbo jets to power this huge 29 kg model

Andy Johnson puts Ken McCormick's 18 ft wingspan B-17 through its paces. Four Zenoah 38 cc petrol engines power the huge model

Above & Right: Nice detailing on the Grumman Hellcat of Steve Rickett. The model was built from the Nick Ziroli plan

Last year some pyrotechnics were added to some of the large WW1 and 2 multi aircraft slots. This year there was more of the same. The pyrotechnics were very good. There were plenty of large ground based fireball explosions and also plenty of simulated flak air bursts too. There were two separate pyrotechnic slots, one for the World War 1 aircraft and the second for the World War 2 fighters and bombers.

Last year there were some very big flaming infernos next to the Cosford runway and there seemed to be a sort of competition to see who could fly through a fireball! Last year's clear 'winner' was Gregg Veasey, who managed to fly his big Meister P-47 straight through the middle of a large ball of fire. The P-47, when it landed, was covered in whatever fluid they use in the explosion. I think this year's unofficial 'winner' was probably Steve Kasch with his Nieuport 17, during the World War 1 pyrotechnic slot. Steve's Nieuport is fitted with a smoke system, which gave the model the appearance of being shot down when he flew very close to one of the airborne explosions.

I think the best display of the day came from the Vulcan and Victor flown by Dave and Andy Johnson respectively, and the Lancaster of Steve Holland. Between them they put on a superb display of close formation flying despite the difference in power of the models. The large crowd really appreciated the high standard of airmanship to maintain the formation. Three top model pilots, together!

Cosford 2016 was another successful show, thanks to the dedication of the LMA team. The planning for 2017 has probably already started, such is the vast amount of behinds the scenes work that goes on to provide a full and top class show. Again a huge vote of thanks to Dave Johnson and the Large Model Association team for all their sterling work. Roll on 2017! **RCMW**

Another superb model built by Steve Rickett – the Miles M39b experimental aircraft

Dave Swarbrick's 1/4.5 scale Grumman Panther

The huge 20 ft wingspan Vulcan of Dave Johnson. Dave always puts on a great display that is appreciated by the crowd

A very evocative display! The Vulcan, Victor and Lancaster (just out of shot) flew together in close formation under a very dramatic sky

Steve Carr uses the smoke system to dramatic effect during the display of his huge PilotRC 60% scale Yak 54

The Catton Hall club put on a superb display with their 1/4 scale WW1 warplanes

The Century Jets Spitfire Mk 22 of Andy Wynn. The 89" wingspan model is fitted with a Zenoah Zg62 petrol engine

Gerhard Reinsch made another trip all the way from Germany. Gerhard put on a great display with his Fokker Eindecker

Steve Kasch's Nieuport 17 is 'hit' by flak during the WW1 display, complete with pyrotechnics

The Nieuport 17 of Steve Kasch makes it back to base!

The elegant Vickers VC-10 being flown by Dave Johnson for the VC-10 team. The VC-10 weighs 64 kg and is powered by four Wren Supersport jet turbines

Skymaster model of the Grumman F9-F Cougar flown by Toby Newton. This is another model painted by Phil Noel at Pinnacle Aviation

Don Billingham's lovely Queen Wasp

John Townsend made a welcome return to Gosford with his very large Miles Magister

Simon Lawson flew his Messerschmitt Bf109 very well. Built from a Meister plan, the model has an 85" wingspan

Trevor Woods' Moki powered CARF Sea Fury had a new paint job over the winter of 2015. The model replicates the Sea Fury owned and displayed by Christophe Jacquard on the current full size airshow scene

Robbie Skipton's massive 65% scale Pitts Challenger

The Dawn Patrol flew their large 1/3rd scale triplanes in close formation

The CompARF Corsair of Tony Hooper. The model features the CARF folding wing mechanism

Jeff Pearson's large 118" wingspan Jungmeister. The power unit for the model is a 3W 140 cc flat twin petrol engine

Steve Holland's large OV-10 Bronco. Built from a Tony Nijhuis plan, it has two Zenoah Zg 62 cc petrol engines for power

Thurston Teal

In the second part of his article on building his 1780 mm span amphibious flying boat, Laddie Mikulasko shows how to construct the fuselage before finishing off the Teal and preparing it for its first flights

Feature Plan

RC MODEL WORLD

At A Glance

SPAN:	1780 mm (70 in)
LENGTH:	1295 mm (51 in)
WEIGHT:	6 lb 8 oz – 7 lb (2.9 – 3.1 kg)
RADIO CONTROL:	4-5 functions (Ele, Ail, Thr, Rudd, optional Flaps)
MOTOR:	MVVS 4.6/1120 KV (38 mm dia. 700 Watt) brushless
ESC:	60 amp
PROP:	11" x 6"
BATTERY:	3S (11.1 V) 5000 mAh LiPo
CONSTRUCTION:	Balsa, plywood, some hardwood

The Fuselage

Cut out all the parts for the fuselage. For the plywood parts use light plywood. Since this model is an amphibious plane the landing gear (when flying off the water) has to be lifted to clear the water surface. To be able to do this, I designed a simple manual operating mechanism.

The box has to be made to hold the landing gear legs. First, cut out the plywood part (63). Cut the part (64) from 1/8" plywood. This part has a doubler (65) of the same shape but cut from 1/32" plywood. The same goes for part (66), which has a doubler (67). Glue the parts (64) and (65) to the part (63) as shown on the drawing. Glue the part (66) and (67) to the part (63) as well. We need these doublers to create a 5/32" slot since the main landing gear legs will be made from 5/32" piano wire.

Now, take this whole assembly and temporarily clamp it to the former (F9) in the location as shown. Make two identical landing gear legs (60) from 5/32" (6 SWG) piano wire. Bend the wire to the shape as shown on the drawing #3. Notice that the inside end of the wire, which is 90 degrees to the horizontal section, is tilted back slightly. This is important so that the landing gear legs will tilt forward when the legs are installed into the fuselage.

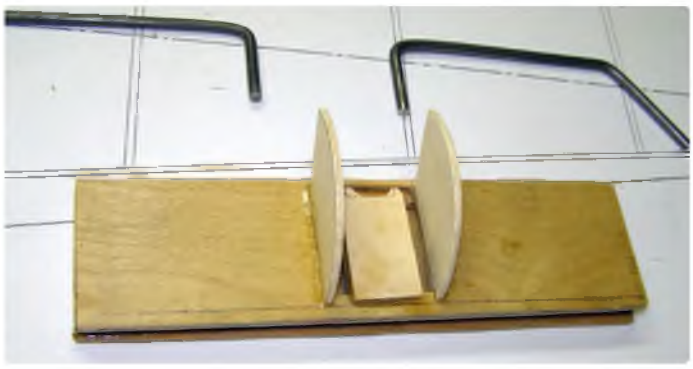
Now test the tilting operation by inserting the inside end of the leg into the openings on both sides of the box.

When the end of the wire is in the slot, slide the leg in until it reaches the opening in the plywood piece (63). Now you should be able to rotate the leg all the way up and push it all the way in to the centre of the slot. If there is some binding, now is the time to sand or trim the plywood parts. To finish this mechanism the remaining parts have to be added.

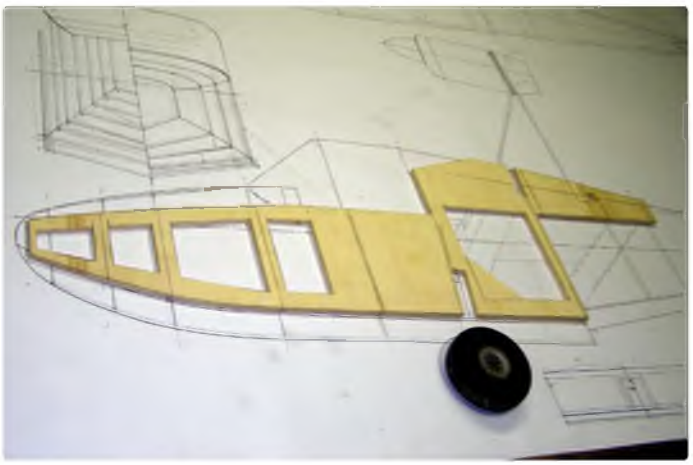
To secure the landing gear from coming out of the fuselage when it is in a tilted back position for flying off the water a retaining box has to be made. Take the two identical parts (71) and glue them to both sides of the balsa part (72). Take this assembly and glue it to the middle of the part (63) as shown on the isometric drawing in the bottom right hand corner of the drawing #1. Complete the box by gluing the parts (70), (68) and (69) to the back of the part (63) as shown on the isometric drawing.

With this box in place push the landing gear in all the way where the opening slots are. Rotate the legs up and then push all the way to the middle of the box. When the legs are

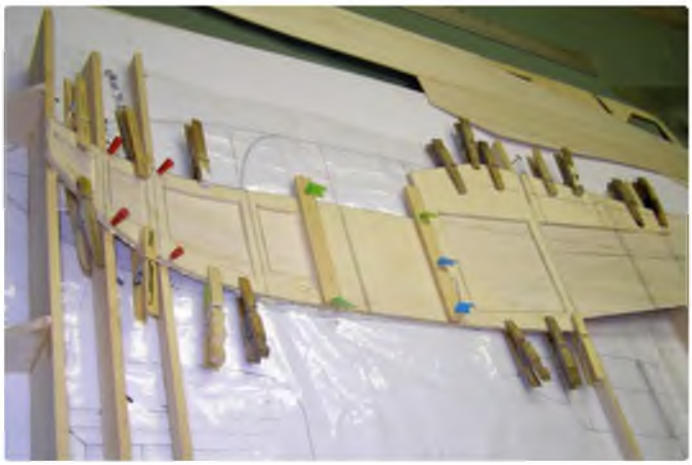
First stage of fabricating the folding landing gearbox



Half radius balsa box hides the protruding wire landing gear ends



Lay 3|32" balsa sheet side with its 1/8" plywood doubler



Use the bending jig shown on the plan to bend the fuselage to shape while the glue dries

Fitting the landing gearbox to the left hand side panel

Landing gearbox in position behind former F9. Note the balsa battery tray and floor

in the middle of the box the ends of each leg should fall onto the balsa block (72). The plywood pieces (71) on either side of the balsa block will prevent the legs from coming out when flying off the water surface.

If you are satisfied with the operation of the landing legs glue the entire assembly to the back of the former (F9). At the bottom of former (F9) drill two 3/32" holes right into the plywood sheet (63) as shown on the drawing. Insert both landing gear legs into the slot all the way in. Take two self-tapping screws and screw them into these two holes. Now the landing gear legs can't be pulled out until these screws are removed.

Now you can start building the fuselage. Remove the legs from the retaining box before you start to build the fuselage. First, mark the location of the formers onto the fuselage sides (46) and the doublers (47).

The next step is to pre-shape the fuselage sides in the nose section. Using the scrap balsa pieces, make the jig as shown in dotted lines in the top left hand corner of the #1 drawing. Take the fuselage doubler (46) and apply epoxy glue to it. Place the doubler on top of the fuselage side (47).

Now place both pieces on top of the jig. Place enough weights on top of the fuselage side to conform to the shape of the jig. Let the epoxy harden. Make the other side of the fuselage in the same way. In the cockpit area, glue two 1/4" square spruce pieces (52) to the doubler (47); they are needed to keep the cockpit sides straight. Glue the top longeron (53) and the bottom longeron (54) to the fuselage sides.

Build the fuselage upside down. Glue the formers (F10) to (F17) to the sides, keeping everything square. It is extremely important to glue in the former (F10) accurately since it will be holding the plug-in box for the wing halves. Once these formers are glued in, lift the fuselage and place the 1/2" shim under the former (F10). Continue gluing the remaining formers between the fuselage sides.

At this time take the 4" wide balsa battery floor sheet (57) and slide it into the grooves in the formers (F1) to (F6) until it touches the former (F9). Glue this floor to all the formers. Glue in the bottom front keel between the formers (F1) to (F9) and the rear keel between formers (F11) to (F17). Glue on the bottom fuselage sheeting (48) between the step and the (F1). Remove the fuselage from the building board.

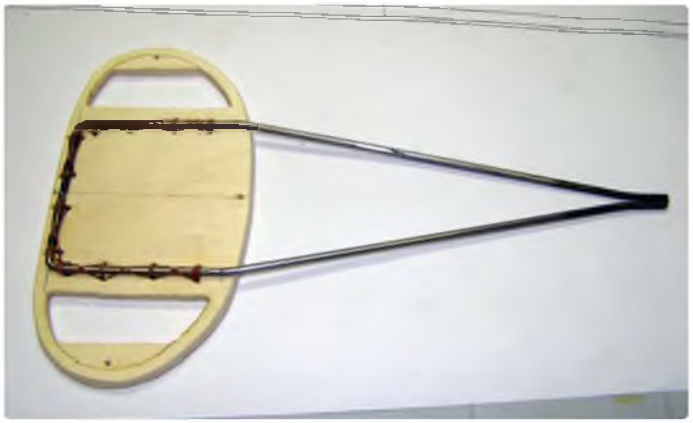
Take the wing's plug-in box and glue it to the former (F10). Sand the ends of the joiner box on an angle to follow the contour of the

Spar box inset into top of fuselage

Servo positions either side of the landing gearbox

Front top deck taking shape

Basic cowl formed from formers N1-N2 with rolled 1/8" balsa sheet. Note the crosspiece is from temporary scrap to hold the shape



Rear piano wire rear leg is 'sewn' and glued to former N4

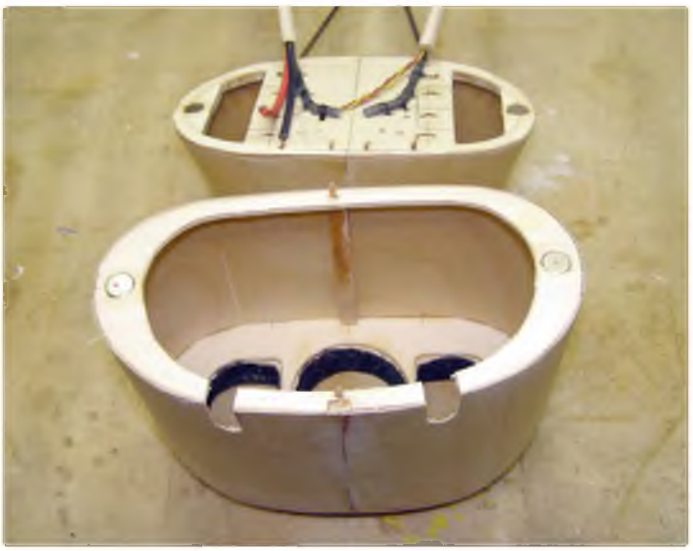
Front piano wire support legs now in place and the nacelle frame is attached

fuselage sides. Slide the wing halves into the slot in the joiner. The rib (F1) of each wing panel should be flush with the fuselage sides. Before you remove the wing halves, drill two 3/32" holes into the plug-in box in the location as shown on #2 drawing. Drill right through the wing's main spar extensions. Two self-tapping screws will hold the wing in place when flying. Glue two hardwood blocks (78) to the plug-in box and to the fuselage sides. Glue one hardwood block (79) to the former (F11). Glue on the top fuselage sheeting (50).

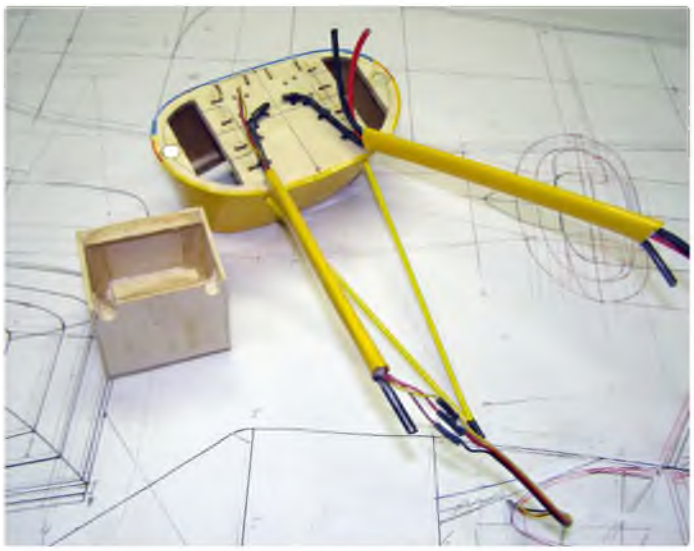
Cut out the 1/4" square hole on top of the fuselage just behind the former (F17). Between the formers (F15) and (F16) make an opening right on the centre line for the flexible control tube for the elevator control. Take the fin and slide the main spar (80) into the opening. At the same time feed the flexible elevator control tube into the holes in the formers (F15) to (F10). When the spar and the tubing is all the way in, the bottom of the fin has to sit on the top of the fuselage.

If satisfied with the alignment, remove the fin and smear glue onto the fin rib (FN1), main spar (80) and the fin's hinge spar (81). Insert the fin and align it with the fuselage. Let the glue harden. In the front of the fin, glue the sub fin base to the top fuselage sheeting (50). Glue the sub fin sides (90) to the base and to the fin. Inside the fuselage, slide in and then glue the flexible tube for the rudder control. Glue on the bottom fuselage sheeting from former (F11) all the way back. In the nose section, glue on the top sheeting (51) over the formers (F1) to (F5). Glue the nose block (58) to the fuselage. Sand the fuselage.

Make the cockpit frame. Line the inside of the cockpit between formers (F6) and (F9) with clear plastic. Pin the frame piece (F7) to the former (F6) and the (F8) to the former (F9). Glue in the bottom of the frame (74). At the top of the cockpit frame glue in 3/4" wide balsa sheet (73) and two dowels (75). At this time you can insert and glue in 1/2" diameter and 1/8" thick magnets into the former (F9)



Front cowl and rear nacelle parts. Inset magnets hold the cowl in place



Nacelle with motor mount box ready to fit

Bottom balsa sheeting and 'step'. Be sure to use a watertight covering!

Removable canopy frame

and into the cockpit frame (F8). The magnets are great way to hold the cockpit frame in the place.

Glue the stabiliser to the top of the fin.

The Nacelle

First thing to do is to bend the 5/32" (6 SWG) piano wire to create the struts (91) and (92). The actual shape of the struts is shown just in front of the fin on the drawing #1. The bending of the strut (91) is a little bit more work because of the angles at which it has to be bent. Cut out the firewall (N4) and the rest of the formers. Drill and cut out openings in all the formers as shown on the drawing. To make the alignment of the nacelle's cowl with the firewall easier, place the (N2) and the (N3) and the (N4) on top of each other. Use the centre lines to align them to each other. Drill the holes for the alignment dowel and the holes for the magnets. In the firewall (N4), drill the holes for attaching the struts.

On top of the fuselage, drill the 1/4" holes 3/4" deep into the hardwood blocks (78) and (79). The hole in left block (78) has a slot cut in it, to create a slot for the motor battery wires. The right block has a smaller slot cut in it to run the extension cable for the speed controller.

Now, take the rear strut (92) and position it accurately onto the back of the firewall (N4). Take thick instant glue and, with a few drops, glue it to the firewall. Use plywood or 1/8" balsa sheet to cut out the two identical templates for aligning the firewall with the fuselage. The shape of the template is shown inside of the drawing #3.

Just in front of the rear hole on top of the fuselage, draw a line across the fuselage sheeting 90 degrees to the centre line of the fuselage. Pin the templates on this line to the top fuselage sheeting approximately 3" apart. Slide the bottom of the rear struts into the hole in the block (79). Press the firewall lightly against the template. Check alignment of the firewall with the line on the fuselage sheeting. With a square, check the alignment of the vertical centre line of the firewall with the fuselage centre line. If satisfied with the alignment, temporarily glue the templates to the back of the firewall.

Now you can try to make final adjustments to the front struts. When done with the adjustments, use thick instant glue, to glue front struts to the front of the firewall. Gently pull out the struts from the holes in the hardwood blocks. With a needle and thread, attach the strut wires to the firewall. Apply the epoxy glue over the thread. Glue the sub-firewall (N3) to the (N4).

Making The Cowl

To be able to align former (N1) and (N2) accurately cut out two part jig pieces. The jig pieces are shown in the middle of the #3 drawing. Fit the two jig pieces into each other and glue them together. Temporarily glue the former (N1) and (N2) to the jig. Glue the sheeting (94) to the formers (N1) and (N2). Glue on the nose block (93). Sand the cowl. Remove the jig pieces by breaking them inside of the cowl and then remove them. Insert and glue the two magnets into the (N2) former and another two magnets into the (N3) former. Glue in the two alignment dowels into the (N2).

Make the rear fairing the same way as the cowl was made. The shape of the jig pieces are shown on the right side of #3 drawing. Sand the rear fairing. If a glow engine is going to be used then the whole rear section of the nacelle can be made to form the fuel tank.

If building an electric version, prepare the motor wires. Take the straight piece of any wood and make three marks. The first two are 4" apart and the third is 6 ½" apart from second. Cut 18" lengths of red and black #13 or #12 wires. Place onto the building board and press against the wood so that one end of the wires start at the edge of the wood. With instant glue, glue the wires together but only between 6 ½" marks. You will need to have approximately 4" of soft wire inside the nacelle and the remaining will be inside the fuselage.

Now take the wires and glue them to the front of the left strut. Glue the extension wire for the speed controller to the right strut. To streamline both struts, glue 1/16" balsa to the sides and to the front of the struts. Sand the struts to a symmetrical shape.

Do not install the nacelle to the fuselage until the model is covered.

Covering

The colour scheme I decided to use is of Swedish registry. It was the most colourful I could find. Cover the model with your favourite material; I used MonoKote. Once the covering is completed, glue on the windshield (100). At the rear of the fuselage install the steerable tail wheel. Bend the bottom half of the tail wheel wire first. Cut out the water rudder (99) either out of brass or thin steel sheet. Solder this water rudder to the tail wheel leg (62). Slide the upper portion of the piano wire into the brass tube (61). Bend the top of the wire 90 degrees as shown on the drawing. Install and glue the rudder hinges into the hinge spar (81). At the bottom of the rudder, drill 1/16" hole into the plywood piece (88). Into the hole, insert a cotter pin (89).

Slide the rudder onto the hinges and simultaneously slide the end of the tail wheel wire into the eye of the cotter pin. Install the horns and hinges to the rudder, elevator and to the ailerons. Inside the fuselage, glue in the elevator and rudder servo trays. Mount the servos. Check all the controls. Depending on the make of the motor, make motor mounts to suit.

Caution

Since the motor batteries are inside the cockpit, and the propeller is close to the removable cockpit canopy, for safety reasons I strongly recommend the installation of a safety plug, in series with the motor battery. The plug should be made from the connectors you are using in the model. The plug must be accessible from the outside of the model. The best location would be on the side of the fuselage, just in front of the wing.

Flying The Teal

After you have assembled the model and secured the wing with two screws, check all the controls. The elevator travel is 1/2" up and down. The ailerons are traveling 3/8" up and down, and the rudder 3/4" left and right. Check the C of G is at the spar box as shown on sheet #1. Adjust if needed by repositioning the motor battery. Steering on the ground is easy.

In a strong crosswind, when taxying, hold in full up elevator to apply more pressure onto the tail wheel.

At the beginning of the article I described my experiences flying the Teal off the water and the ground so there is no need to repeat this. Have fun!

RCMW

Left: Finished in the bright Swedish scheme. Now let's go flying!

Left: With wheels up or down the Thurston Teal looks good and flies really well

CONTACTS

LADDIE MIKULASKO:
lmikulasko@cogeco.ca

PLAN DETAILS

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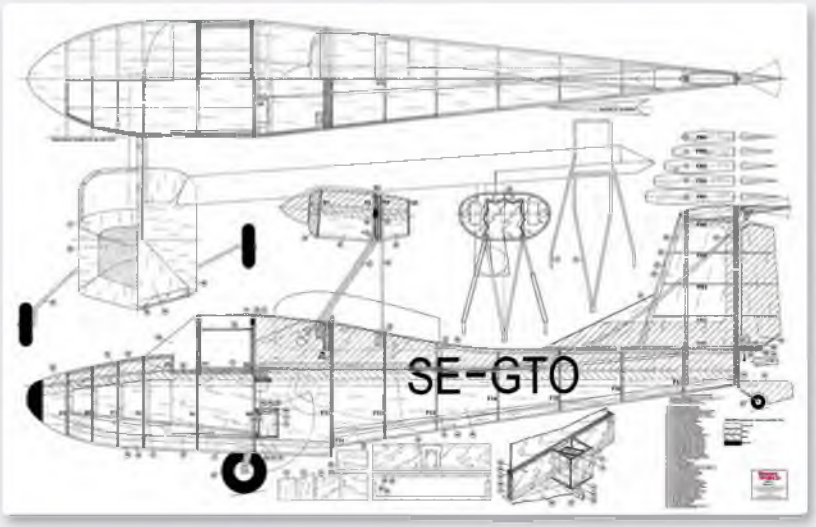

Reference Corner

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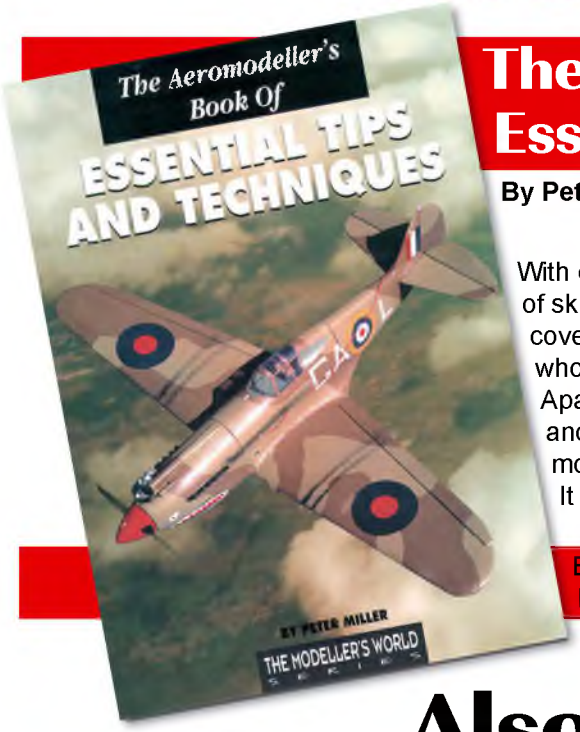
This month we focus on Aeromodelling



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Following on from his article last month, David James flight tests his Gannet fitted with a dummy contra-rotating propeller

Part 2

Simulated Contra-Rotating Propellers

Chris Golds did a fine job of building the Gannet, keeping the weight of this portly model down to 33 pounds. Not bad for a span of 114 inches and two 6-cell 8 Ah LiPo batteries

A view of the assembled spinner. A special nut sits inside the tip of the spinner to fix it to the shaft extension. This was another critical part of the design

Steve Fish (pilot) and I prepare for the first flight with the CR prop. I like hinged access hatches as there's no chance of forgetting to take them to the field – or losing them in flight!

Flight Testing

The CR prop certainly improves the appearance of the Gannet on the ground, but how would it perform in the air? Before going into detail, I should give credit where it is due and explain that Chris Golds designed and built the airframe to an outline specification I provided. I busied myself with the power plant, retracts/oleos, vac-formings, torpedo etc. The initial flights were carried out using single two or three-bladed props, with Chris performing the 'maiden' at Westonzoyland in the spring of 2015.

The 33 pound, 114 inch span model flew beautifully from the start. It was certainly quiet – far too quiet – but we intended to do something about that just as soon as the CR prop could be perfected. In the meantime I played around with various air whistles but the results were disappointing.

The waiting period gave me time to worry about how the CR prop would affect, or even compromise, flight performance. There was not much to go on other than the measured static thrust of 29 pounds, which should give the 33 pound model a very sprightly performance. The in-flight (dynamic) thrust could be very different, however. I made sure that the 34 ounce weight of the CR prop did not move the C of G forward, compared to the single prop version, by adding appropriate weight near the tail.

I expected that throttle response would be delayed due to the need to accelerate two propellers, the front free-wheeling prop being generally quite slow to pick up speed, particularly at low throttle settings. The opposite occurs during deceleration, of course, so I expected the overall effect of the CR prop to reflect the throttle dynamics of a turboprop rather than the near instantaneous response of an electric power system. This is quite appropriate, really, as the full-size Gannet was powered by twin Armstrong-Siddeley Mamba turboprops. Finally, the effect of six blades as opposed to two, or three, would be to increase drag when throttled back, so it would be important to maintain a higher power setting during a landing approach.

As it turned out, I need not have worried because the first flight with the CR prop went without a hitch. Steve Fish did the piloting while others concentrated on getting good video and stills. Full throttle was not needed at any point during the flight and general handling seemed unaltered from previous flights with the single three-blade 20 x 12 prop, apart from the anticipated deceleration effect from the six blades when throttled back. The air-brake effect is so pronounced that flaps are seldom needed when landing,

The CR prop looks good in the air, especially with a camera to 'freeze' the blades. Here the Gannet is on a landing approach, with the arrestor hook ready to grab the wires. Best to make sure the radome is retracted before you get to this point!

All cleaned up for a fast Farnborough pass with the CR prop howling like a banshee. The Gannet has a fair turn of speed in this configuration and is easily capable of simple aerobatics

The weapons bay carries a Mk.30 homing torpedo that is dropped in flight from a low altitude. The small retardation 'chute slows the tin fish and ensures that it enters the water behind the Gannet, at the correct angle, and pointing in roughly the direction of the enemy

other than when additional lift is required.

The only fly in the ointment was that the motor started to 'hunt' after a few minutes, thus losing power and forcing an early landing. We eventually discovered that this was due to the thermal protection system in the ESC sensing that it was overheating. By repositioning the ESC and ducting cold air to it the problem was easily rectified so that flights lasting 10 minutes are now practicable.

The Turnigy ESC does not allow data logging of motor parameters, so I replaced it, temporarily, with a Castle Creations Phoenix ICE 160 HV ESC borrowed from another model. I recorded data for two flights: one with the CR prop and the other with the single three-blade prop. Ground run measurements of volts (41.6), amps (99), and rpm of the driven prop (7100), revealed virtually no difference between the CR and conventional props.

A similar message resulted for measurements logged during the two flights. Although it was difficult to replicate the same flight pattern for each flight, we tentatively concluded that power consumption was slightly higher for the CR prop, suggesting a small reduction in efficiency. When the throttle was chopped suddenly on the downward side of a loop the driven prop windmilled at about 2500 rpm until straight and level flight resumed. No accurate thrust measurements were made (static or dynamic).

We were not able to make any direct measurements of the speed of the free-wheeling prop but hit upon an idea to derive it from a frequency analysis of the sound track of the flight. The highest recorded pitch occurred at maximum throttle (about 7100 rpm) and was almost one octave above middle 'C' (about 520 Hz). It seems reasonable to suppose that the note we hear during the flight bears a direct relationship to the frequency with which the blades on the driven and free-wheeling props pass each other, subject to a correction for the Doppler effect if the model is travelling towards or away from the observer.

For three-bladed props the blade passing frequency will be 520 x 60/3=10400 per minute. We know that the driven prop is rotating at 7100 rpm so the free-wheeling prop must be spinning at 10400-7100=3300 rpm, or just under half the speed of the driven prop.

Role Of The Free-Wheeling Propeller

Irrespective of the relative rpm of the free-wheeling prop versus the driven prop, there will be a pressure drop across the free-wheeling prop, so the velocity of the airflow to the driven prop will increase, as well as acquire a tangential (rotational) component. Thus the airflow presented to the driven prop will change the effective angle of attack of its blades. If the angle of attack is reduced this is equivalent to an effective pitch reduction for the driven prop, which means that static thrust might improve at the expense of dynamic thrust. This is pretty much what we observe, although the effects are small.

Another approach is to consider changes in the work done by the driven prop because it has to accelerate the free-wheeling prop as the throttle is opened, and continue to do work on that prop to keep it spinning at constant throttle. This would imply a reduction in overall efficiency unless the free-wheeling prop acts as a rotating guide

vane that optimises flow to the driven prop and improves its efficiency. A rotating guide vane can be made to work very successfully provided the designer is able to fine-tune the pitch of its blades and its rpm relative to the driven prop (clearly not the case in the present set-up!).

We can safely conclude, however, that the swirl component of the airflow behind the driven prop will be less in the case of the simulated CR prop. This means that prop-wash over the tail surfaces will also reduce, as will its undesirable effect on yaw and roll when the throttle is opened or closed. Furthermore, the effect of two propellers spinning in opposite directions will reduce the gyroscopic effect of the propulsion system, thus improving the turning behaviour of the model. Torque, on the other hand, should remain sensibly constant.

A 'Tall Story'. Just to give a sense of the size of the Gannet, Pete Stamp claims he is almost 7 feet tall!

I can't wait to get back to the Wyvern now that Pete Fullard has given me his scale spinner plug!

Much more flight testing is needed before we can draw more meaningful conclusions. I can, however, affirm that the Gannet is a delight to fly with or without a CR prop. In the meantime, perhaps some readers with a better knowledge of aerodynamics and the design of CR units can correct and improve my speculations?

Where Next?

I intend to continue flight-testing the Gannet during 2016 with as much on-board instrumentation as I can muster. I have been using the comprehensive data-logging capability of the EagleTree VECTOR flight controller in another model and I intend to transfer it to the Gannet.

I also want to return to the Wyvern, building on our experience with the Gannet. My good friend Peter Fullard has loaned me the plug that he produced for the epoxy glass spinner he made for his Black Horse Wyvern. His spinner is as true to scale as one can get and the trouble he has taken in producing an accurate plug has given me encouragement to try again, with every hope of fabricating spinner mouldings that are also accurate, with uniform thickness and, hence, much easier to balance.

Was It Worth It?

Looking back, I think I must have entered every blind alley that beckoned me, before reaching one that led to the 'final' satisfactory design. Hopefully, the information contained in this article will inspire others to have a go, with some confidence that their efforts will be successful. If advice is needed please contact me via RC Model World.

Some mistakes could have been avoided and time saved if I had not tried so hard to keep things simple. This is usually a laudable trait, but not when it results in under-engineering. A design approach that might have worked perfectly well for a smaller, lower-powered model did not adapt well to a propulsion system that absorbs over seven horsepower. Similarly, I did not appreciate the magnitude of the vibration issue and the standards of machining and fabrication required to keep it under control.

On the other hand, one thing that concerned us initially was the possibility of 'whirl' occurring in the extended shaft. This could cause the shaft assembly to resonate at certain critical rotational speeds and develop vibration amplitudes sufficient to cause bearing damage or even failure of the whole assembly. As it turned out, we need not have worried!

In the end I think all the hard work was worthwhile, if only for the improved appearance of the CR prop. The sound is better, too, although of a higher frequency than the soundtracks of turboprops that I have studied. I can even claim that the free-wheeling propeller is a true scale rendition of the full size Gannet when 'loitering' over the search area with one of its twin Mambas shut down and the propeller feathered!

The jury is still out on improvements to performance, or otherwise, but the simulated CR prop is certainly no worse than a conventional single propeller and that, to me at least, is reason to be happy. Finally, I repeat my thanks to all those referred to in the text, without whose help I would not have flown such satisfying scale renditions of two iconic British aircraft. ***RCMW***

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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.

SPECIFICATIONS

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- Print speed: 0.4mm nozzle, up to 16mm3/s
- Motion: Up to 250mm/s, 4000mm/s2 acceleration, segmentation free real time delta movement
- Nozzle: 0.4mm diameter, maximum operating temperature 300°C, warm up time ~ 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

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In The Loop

Keith Jackson makes a welcome return with his column dedicated to precision aerobatics, as he reports from the F3A Nationals. Additional photography by Ashley Hoyland

Garry Peacock's BJ Craft Inspire compared with Keith Jackson's BJ Craft Agenda

Pilots at the 2016 BMFA F3A Nationals

With Barkston Heath being unavailable for this year's BMFA Nationals, the F3A component of the UK's premier event was held at the Plane Crazy Model Flying Club, near Hurley in Warwickshire. Over the last few years the PCMFC has developed into one of the main flying sites for GBRCAA competitions here in the UK, offering a superb flying site and a central location. Moreover, the welcome given by members and club proprietor, Steve Carfoot was second to none and this event saw a superbly marked out flight-line with sheltered judging positions and seating provided for pilots and spectators.

Barbecue food and hot beverages were offered on both days of this two day event, again provided by a few dedicated club members, which was greatly appreciated by all who attended.

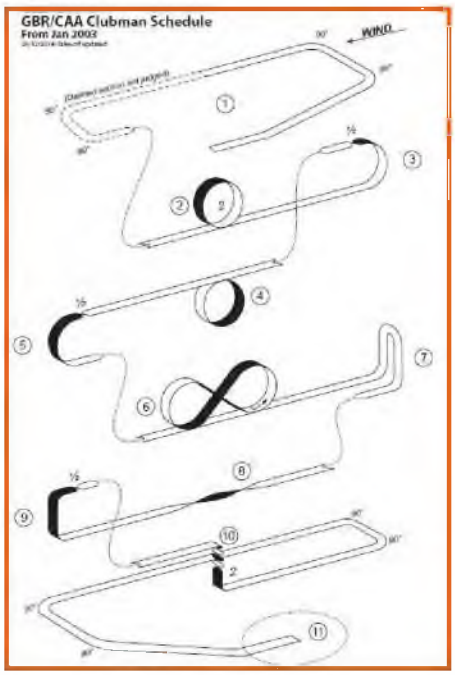
The event started on time after a short briefing by club member and Competition Director, Adrian Harrison. A low entry of fifteen pilots registered to fly in the four classes available to BMFA members, these being Clubman, Masters, FAI P and FAI P & F schedules. Clearly, this meant just a handful of pilots in each class, though this is partly due to the number of schedules that are available to be flown.

These schedules range in complexity from Clubman, which is aimed at anyone who can fly through the BMFA B & C certificates, all the way up to the FAI international class Preliminary (P-17) and Finals (F-17) schedules. These latter schedules are normally flown in national and international competitions throughout the world and were used at the F3A European Championships in Germany recently.

Weather Watch

The weather at the start of the event was overcast but bright, with early morning sunshine breaking through occasionally to create a glary sky against which models appeared in silhouette. Conditions like these can really make or break a competition flight if the pilot is not used to them. The inability to see where the wing is in relation the fuselage side can lead to significant downgrades so it is important to practice in all conditions, however unpalatable.

To help pilots cope with the position of the sun, a sun dot was provided by the club and these are used throughout the international competition scene. The principle is like putting your hand up against the sun and looking around it; in this case a small opaque disk was positioned close to the pilot to block the direct light from the sun but allowing the pilot to see the model without being dazzled.



GBRCAA Clubman schedule flown at the Nationals

Masters pilots at the 2016 Nationals. Left to right: Ian Mold (BJ Craft Fantasista), Alex Moseley-Jones (Mythos S) and Alan Williams (Gaudius)

Round Up, Day One

Masters pilot Ian Mold had the dubious honour of being first off on the Saturday morning, which is always difficult for any pilot. Ian flew a BJ Craft Fantasista 110, which is an entry style model for 8S LiPo power, using a low cost Turnigy motor, driving an APC 18 x 10 propeller. This model is distributed by Bondaero here in the UK and is based on Japanese pilot Yoichiro Akiba's 2 m version that he campaigned in recent years. Featuring a two part wing and fully built up construction, Ian flew the model well throughout the weekend, winning every round and eventually the competition.

Second place in Masters was taken by Eugene Anker flying a Spark Evo 2, powered by a Hacker C50 turning a three blade propeller. Eugene is one of those key individuals within the GBRCAA who helps with the running of these events without fuss, and he was to prove invaluable in a minor crisis that was to emerge on day two of the Nationals.

The FAI P-17 class were next to fly, led by Mark Pearce flying another Spark Evo/ Hacker C50 13XL. This schedule is similar to the Masters schedule but with increased complexity. For example, the vertical figure S from the bottom line in Masters is a figure S in FAI P-17 but with a half roll integrated in the second part of the manoeuvre. Integrated rolling manoeuvres like this were very rare even only several years ago.

Models and power trains have continually developed in order to accommodate changes in the FAI schedules, as can be seen in the header picture of Garry Peacock's BJ Craft Inspire (circa 2014-15) compared with my BJ Craft Agenda (2015-16). The fuselage side area of the Agenda is almost equivalent to the wing area, meaning an almost seamless transition to knife-edge flight can be made, as well as accommodating high 'G' knife-edge turns required in the current schedules.

New GBRCAA member and PCMFC member, Chris Halgreen was third to fly in P-17 class and he brought his beautiful Angels Shadow/E-factor E505 contra drive to the competition. Originally from Botswana, Chris has progressed steadily up the rankings in this class this year and he produced some very high quality flying over the weekend to end up second overall in his category. F3A enthusiasts may remember the Angels Shadow as being one of the first fully moulded commercially produced competition aerobatics models, which debuted in the 1999 Pensacola F3A World Championships when flown by Ivan Kristensen.

Since then designer and manufacturer, Vladimir Kozlowski has continuously updated the model to its current electric powered form whilst maintaining the very highest construction and finishing standards. Chris' version features quite a broad semi-elliptical wing, which gives the model a unique look in the air and allowed it to groove through radii without looking forced.

Wing shape, such as the elliptical curves of the Angels Shadow, is another change that seems to be more strongly featured in today's F3A models. Loosely comparable shapes, such as the double tapered leading edges of the BJ Craft Episode, Inspire and Agenda or the almost triangular wings of the Oxai Kunzit (Wolgang Matt design) or Oxai Galaktica (Christophe Paysant Le Roux), all appear to try to maintain wing area whilst reducing tip area to enhance snaps, which are prevalent in FAI F-17.

Eugene Anker with his Spark Evo 2/Hacker C50

Mark Pearce and Linda Shepherd with a Spark Evo S/Hacker C50. Mark took third place in FAI P-17

Chris Halgreen and his 2016 Angels Shadow

Interior shot of the Angels Shadow showing superb workmanship

Leslaw and Michael Przytocki with own design Axis/D3 Adam Debowski Contra Drive system

Interior shot of the Axis showing the motor installation

Hacker C54 motor fitted with the Ralph Schweizer Contra Drive

Recently the BMFA News featured an article on the Lepton, a home built model by GBRCAA member Adrian Mansell. Sadly, Adrian wasn't present at the Nats this year but fellow competitor Leslaw Przytocki was with his home built model, the Axis. Originally from Poland, Leslaw is a skilled composite engineer who works for EasyComposites.com in Stoke. It is fair to say that Leslaw rarely takes anything on face value and is renowned for trying things himself, resulting in his own design F3A model with several unique features.

The model has a moulded fuselage and film covered foam-balsa wings, again with a double tapered leading edge forming an almost triangular wing planform. The model uses an all moving tailplane to good effect, as per the current BJ Craft fleet of models. Finally, propulsion is provided by an unusual type of contra rotating propeller system, developed by top Polish pilot Adam Debowski. Instead of the normal gearbox or gear/belt drives, this system uses two concentrically mounted motors running in opposition to produce the contra rotating effect. The benefits of this system is a complete absence of any gyroscopic effects present on single motor systems and it uses two relatively low powered motors instead of a single high powered and hence costly motor. In addition two smaller Jeti Opto 77 electronic speed controllers are used. The sound of this system is totally unique, with a complete absence of the gear type whines of other contra drive systems and instead it produces just a gentle hum.

It is still early days for Leslaw's design but he is so encouraged that he is planning the next version for 2017. Leslaw flew very well throughout the weekend, winning five out of six rounds to take top spot in FAI P-17 category.

Competition Director, Adrian Harrison was next to fly with his BJ Craft Agenda, fitted with a Ralph Schweizer Contra Drive system, itself driven by a Hacker C54. This motor is a newish product from Hacker and was showcased at the 2015 F3A World Championships by internationally renowned pilot Wolfgang Matt. Ambient temperatures in Switzerland during this event were around 35 ºC and many there were amazed at the cool temperature of the C54 motor after Wolfgang's competition flights.

This may sound trivial but controlling the temperature of the motor has long term implications for the integrity of its magnet's glue joints and coil stability, which affect the performance of the system over time. Getting the cooling right will safeguard an expensive piece of hardware in your F3A set-up. In addition to this the C54 is around 15% more powerful than its predecessor, the C50, making it the current motor of choice in F3A.

First round nerves were showing in the FAI P-17 class and most pilots ended up zeroing one of more manoeuvre in the hazy light. Adrian was one pilot who didn't and he flew well to take the first round with 1000 points.

Clubman class were up next with three entries headed by Alex Moseley-Jones flying a Sebart Mythos 50 S/Hacker A50 motor. This is an excellent entry class model that can be flown to a high standard for very little cost. Alex also flies in the GBRCAA F3P league during the winter season. We hope to see more of Alex in F3A next year.

Finally, the P & F category got to fly with again just three entries in this, the highest category offered. First off was UK Team member Matt Hoyland with his Oxai Kunzit biplane, designed by Wolfgang Matt and powered by a Ralph Schweizer CRS Contra drive. The package looks and flies really well in all conditions but comes at a hefty price, which approaches the cost of a small car!

Second to fly was myself with a BJ Craft Agenda fitted with a CRS contra Drive and using Optipower 10S 5800 mAh LiPo packs. This is a great model and built on the qualities of the Inspire model I flew throughout last year. It is also very light, coming out at 3519 g, which allowed me to use heavier LiPo's with extra capacity to attain longer practice flight times.

Last to fly in the round was Garry Peacock with his BJ Craft Inspire fitted with a Brenner v3 contra drive. This is exactly the same set-up as I flew last year and it didn't disappoint. Garry's standard of flying has significantly improved and he scored highly throughout the competition.

After the end of this round Matthew was leading, though by only a fine margin of 3.5 points in a 1000. Scoring in F3A starts with a raw score, which is the sum of the individual scores for each manoeuvre, multiplied by its level of difficulty or 'K' factor. The highest raw score in the round automatically gets 1000 points and then everyone else's raw scores are scaled accordingly. This difference resulted from a raw score difference of 1.6 points out of 469, so it was a very low margin, but in F3A that's all that counts eventually; win 4000 points at the Nationals and you win the event.

Two more complete rounds were flown on the Saturday before a prolonged bout of rain stopped flying for the day partway through round four.

Round Up, Day Two

Day two of the Nationals started at 9 am, with the remaining flights from round four. This time the weather was better with brighter skies and a fair amount of sun to contend with.

Third to fly in the FAI P-17 class was Adrian Harrison and all did not go according to plan. Adrian and I have called for each other over many years and I instantly knew something was not right after the first manoeuvre, the Eye Catcher. He seemed to have difficulty seeing the model and shortly after decided to terminate the flight. He landed the model safely but then collapsed on the flight line.

Fortunately there was enough first aid knowledge within the assembled pilots to help Adrian into a comfortable position and a decision was taken to call for an ambulance, which duly arrived a short time later. I'm glad to say that after Adrian was taken to the local hospital for checks, he managed to make a full recovery in a very short space of time. Sadly he was unable to continue with running or competing in the competition, so Eugene Anker took over the mantel of Competition Director for the remaining part of the day.

After four rounds had been completed the P & F group switched to the FAI F-17 schedule for two further rounds. This schedule appears to have been deliberately constructed to be as difficult as possible, as you might expect for a finals schedule that is supposed to differentiate between the top pilots in the world. Two rounds were flown, with the best score from these being added to the best three scores from the four preliminary rounds. The eventual results are shown below, with Matthew Hoyland coming out on top and retaining the SMAE Trophy for a third year in a row.

During the closing ceremony our sincere thanks were offered to the PCMFC for the use of their superb facilities and to the judges during the event, Peter Cappleman, Alan Simmonds and Gerhard Fehringer. ***RCMW***

Adrian Harrison and Chris Halgreen with Adrian's and my BJ Craft Agenda/CRS Contra drive

Alex Moseley-Jones flew his Mythos S to first place in Clubman

FAI P & F class winner Matthew Hoyland with his Oxai Kunzit/CRS contra drive

Class	Pilot	Total	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6
Clubman								
1	Alex Moseley-Ames	**4000**	1000	1000	1000	1000	1000	1000
2	Alan Williams	**3667.81**	938.82	742.25	913.63	951.64	745.66	863.72
3	Lewis Philip	**3424.91**	981.01	761.63	788.87	818.18	818.88	836.85
Masters								
1	Ian Mould	**4000**	1000	1000	1000	1000	1000	1000
2	Eugene Anker	**3503.51**	934.69	840.17	854.66	860.23	853.93	706.98
FAI P-17								
1	Leslaw Przytocki	**4000**	875.73	1000	1000	1000	1000	1000
2	Chris Halgreen	**3907.35**	958.86	991.76	846.21	965.52	965.74	991.21
3	Mark Pearce	**3665.13**	921.91	952.22	815.46	871.47	919.52	908.07
4	Steve Hunt	**3282.39**	791.77	831.96	701.1	827.59	831.08	824.14
5	Ashley Hoyland	**2997.28**	761.54	716.64	642.74	744.51	729.88	774.58
6	Adrian Harrison	**2673.46**	1000	850.91	822.56	DNF	DNF	DNF
FAI P-17 & F-17								
1	Matt Hoyland	**4000**	1000	1000	991.26	1000	1000	1000
2	Keith Jackson	**3937.78**	996.45	974.16	1000	DNF	DNF	967.17
3	Garry Peacock	**3819.44**	953.8	861.73	980.33	953.85	931.46	929.92

2016 BMFA F3A Nationals Results

Steve Carfoot with Greg Cooke (left) and Alan Nish (right) of the Plane Crazy Model Flying Club, who helped make the 2016 F3A Nationals happen

Dogfighting Down Under

Greg Thompson introduces his sturdy Fokker biplane, suitably beefed up to survive R/C combat skirmishes

The annual event in Victoria draws quite a few combatants

Once a year, at an undisclosed location in Victoria, Australia, a group of dedicated and determined individuals get together to 'recreate' the iconic aerial battles of the Great War. They are never certain just how many allied or German aircraft will turn up, just like the 'real' war, but one thing is certain – nobody goes down without a fight!

As with most combat competitions, each aircraft tows a short length of paper streamer and opponents attempt to remove it, or sections of it, from the aircraft. One real difference in these battles is the dogged determination to be displayed by the combatants, and the very real likelihood that one or more models in any particular battle will fall foul of the repeated thrust and probe, and slashing attack from all quarters.

Damage and even total loss in this war is just as real a potential as in the full size battles, though obviously no pilot is harmed (necessarily) in the process. This is where a solid and durable model can make all the difference. As they say, all's fair in love and war...

Each pilot and his/her assistant wears a hard-hat for safety, and all observers are briefed to watch out for errant models, damaged beyond controllability, or perhaps being flown by an injured and disoriented pilot desperately fleeing the battle area and attempting to make it back to more friendly skies.

There are few rules to these battles, and almost none applying to the aircraft. The only requirements are that the aircraft shall be powered by a .25 cu. in. glow motor and be representative of a WWI type, either German or one of the Allies. Fighters or bombers are allowed, though of course the bombers are pretty much 'cold meat' for the fighters unless escorted through the area by their smaller friends. Electrics are not permitted due to the very real possibility of LiPo damage and/or fire – this is Australia we're talking about, with lots of dry grass around.

Enter The Combat Fokker

With this combat weekend in mind a friend of mine asked me to design a suitably robust model for him to compete with, hopefully strong enough to help him survive the battles and bring home a trophy – if not a functional model – at the end of the weekend. He was partial to the Fokker DVII and was currently using a modified David Boddington plan as the basis of his models.

With this in mind I set about finding a good three-view drawing of the DVII and scaling it


A Fokker climbs away, hauling its streamer


A German plane makes a successful cut, severing the streamer of a British biplane


A straight streamer makes an easy target


A speedy stall turn soon has this model diving back into the fray

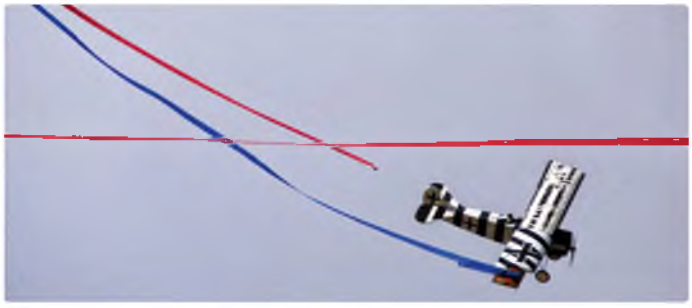

Coming soon! Greg's 'Combat Fokker' will be a plan feature in a forthcoming issue of RC Model World


Combat Fokker is designed to be tough and quick to rig


Combat pilots only use IC engines due to the fire risk from damaged LiPo packs. However, the RCMW plan will feature an electric conversion too for sport flying


Wing panels are designed to be interchangeable, allowing for speedy repairs between bouts


A squadron of German aircraft line up. Let battle commence!


This Fokker has caught an opponent's streamer with its interplane strut

to a suitable 1/8 size, and then designing the internal structure that would serve to keep the model airborne throughout the various battles. Of course, it is not practical to build a model that is totally impervious to this kind of abuse. It would be too heavy and unlikely to fly at all. However, I thought that if I used plywood for the fuselage structure wherever possible, and built similarly robust wings, we should be able to work this out.

With judicious use of lightening holes the plywood fuselage proved really quite easy to design, and only a few liberties were taken in the interest of simplicity and ease of building. Remember, that it is assumed that each competitor will take two or three models to the weekend (though there are no limits), so it would be important that the model be simple and quick to build. Also, the parts should be interchangeable so that a wing from one could be used on a fuselage of another, for example, in order to reuse parts from less successful combat encounters.

Wherever possible the scale outline was maintained and even the aerofoil used is close to the originals. One simplification was the use of 10 mm flat aluminium for the cabane struts, as it was felt that bent wire was more time-consuming and difficult to ensure consistent alignment. Having said that, none of these models were likely to be built perfectly true anyway, nor stay that way throughout the weekend, so repairability was also high on the list of desirable features.

Hardwood main spars, sheer webbing and aluminium wing joiners would provide the bulk of the strength for the wings, with aileron servos being attached to plywood plates to offer some protection, as well as easy replacement should the need arise. Finally, the wings are covered by conventional materials, heatshrink plastic or fabric, or even an inexpensive and easy paper alternative. This was often how the fuselage covering was achieved anyway.

The plans were drawn in CorelDraw and full use of laser cutting was envisaged from the beginning, so some parts are quite complex. Having said that, they fit together well and the fuselage can be built on any surface, including your lap! The wing also needs a basic surface and having a flat bottom makes it a perfect candidate for a corner of your workbench.

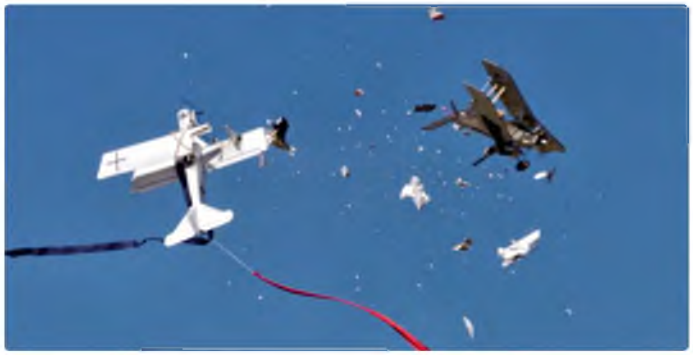
For those interested in building this model for an electric power-train, I've designed a supplemental plan. I stress that the electric version is not planned for combat due to the more fragile nature of LiPo batteries, but it can certainly be used as a Sunday flyer or a practice bird without any messy fuels.

My personal Fokker is to be powered by a Saito 45 four-stroke. This will allow me to swing a bigger propeller and use the extra heft of the engine to balance the model instead of having to add weight or move items around in the confined space of the fuselage. All up, the Fokker is a great little model, which is easily built and finished, and flies well. If you want to set up your own combat weekend, you'll just need to find a friend with an SE5a or Camel, and a paper streamer. Go for it! ***RCMW***

Combat Fokker Plan – Coming Soon!

Greg's plan for the Fokker DVII will be published soon in a forthcoming issue of RC Model World. Keep your eyes peeled!

Thrusting and probing, three models go on the attack. The Fokker could have a tough time landing without its wheels!



Sometimes the models get a bit too close! Heavy damage is a common occurrence and it can be terminal

A well worn SE5a takes off. If you like to keep your models in pristine condition then R/C combat is probably not for you!

Combat Fokker has a ply fuselage to fend off the worst of any battle damage

When safely back in the workshop any damaged covering can be stripped off and the model recovered, ready for the next sortie. Pin up any discarded panels as mementos of battles past

In Australia, German colour schemes are as popular as the Allied ones. It makes you wonder if things would be so well balanced if WW1 R/C Combat was held here in the UK?

Look – no hands! Another SE5a heads off for a scrap

Our thanks go to Tracey Cosier for the airborne and other 'action' photos used in this article

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The Sport Channel

Another selection of sport flying revelations from Gray

Your author's 'Little Bit' tailless by the late Dereck Woodward presides over Dereck's final plans collection, which has returned to the UK for our safe keeping. Fans of Dereck's plans range can expect some good news – see text

"Every gift from a friend is a wish for your happiness" (Richard Bach)

This Month's Wise Words

Last time, we mentioned a series of modelling gifts that were extra special due to having been completely unexpected, but all destined for my new workshop. My Aerographics prototypes and giant scale rubber kits were an embarrassment of riches, but my gifts from respected designers was not yet over. Not long after our last edition a large parcel arrived from the USA. As I opened it, I realised that it was stuffed with dozens of rolls of model plans. As I unpacked it, a small, yellow sticky note dropped out, covered in notes and technical jottings, in the handwriting of my late, greatly missed friend Dereck Woodward.

It was a sudden, strange flashback to twenty years ago, when Dereck would send SMA plans and articles, all augmented by his enthusiastic annotations. Delving further, it transpired that the parcel contained what was left in Dereck's plans collection during his final years. Dereck's widow Sue explained that Dereck had wanted me to have his plans and as he'd been pivotal in founding this column, he thought it fitting that I gave them a home.

The collection is typically diverse and contains what must be the first print copies of many of Dereck's published designs, plus early drafts that show what an accomplished draughtsman he was. Included are later designs by other modellers, which were amongst his final projects.

One find though is so significant that it actually prompts me to make an announcement here, and I'm sure this will please Dereck's loyal fans around the world. Amongst this highly individual set of plans were three unpublished designs by Dereck... All I can tell you for now is that two of them are classic Woodward, but with some variations in style, and the third one is unusual and a beautiful piece of construction for real 'builders'. I can tell you that Sue has given me permission to try and get these designs either published or kitted, which I intend to do.

All require more drawing work, then prototypes building and testing, but eventually it will happen. We'd like to hear from any admirers of Dereck's work – what would you think of some new ones? Now there's a prospect!

KK On Camera

News for another of our 'special interest' groups now. This one is for all the 'Keil Kraft Kids' reading this. I'm not sure if we first coined that phrase, but I've seen the term used elsewhere subsequently. Anyway, we know who we are!

Those of us brought up on KK's kit range, like me, must at some time have wondered how the kits came into existence and what kind of otherworldly place they could have originated from!

The Internet has brought us so much rare and previously unseen modelling material and we KK Kids are the latest to have some wishes fulfilled. If you look on YouTube, you'll discover a priceless video of Keil Kraft's factory in Wickford, Essex, filmed in the mid-1960s.

As you'll see, it's astounding, revealing, surprising and a glimpse into a vanished world. Although described as a 'tour' of the KK works, the footage has a 'home movie' quality rather than an official promo.

Captured on film are founder Eddie Kiel (soon to die tragically), plus KK's Eddie Cosh and Ernie Webster. Viewers have commented how antiquated the factory and its equipment appear, despite the 60s time frame, much of it pre-Health & Safety! The size of the premises was astounding to me and I was delighted to spot a production line of Nomad gliders ready to go! Watch, via the link on the final page, and enjoy this exceptional piece of British aeromodelling history.

'Keil Kraft Kids' everywhere should love this! Most of us who grew up with KK kits at some time must have wondered how and where they were manufactured. A unique video of the KK factory in Wickford, Essex in the mid-1960s has recently appeared online and it's priceless! (Copyright/acknowledgement Dudley Webster)

The Owl And The PK Kit

Since this column began, I don't think a year has gone by without our mentioning or featuring the designs of Peter Fisher and his Performance Kits range – in fact, several have appeared here recently.

Fisher's slightly quirky designs set the PK range aside as something quite special in my early modelling days. Although they appeared enticingly in magazine adverts my local shop never stocked them and it wasn't for a full five years that I finally saw a PK design built and flying.

In 1970, when I joined my club, I watched in wonder as a member flew an 'Apex', a fairly conventional cabin model but for its triple-finned tail group. This flew free flight for a few months and then spent the rest of its flying career with single channel R/C.

As I shopped further afield, I picked up a few PK kits and mostly had success with them. During my model shop days in the late 1970s, we sold a lot of PK and I wish now that I'd stocked up then!

Rescued from obscurity! Simon Rogers' re-creation of Peter Fisher's Performance Kits 'Owl' glider from 1969. One of PK's less well known designs, it may enjoy a revival as a laser-cut kit

One kit that I never saw on the shelves, or as a finished model, was the 'Owl', a modest little 29" span twin-fin glider. Although not 'unorthodox', it was clearly from the mind of Peter Fisher. Apart from one review and an Aeromodeller cover in 1969, the Owl had little exposure, though it continued to be listed in PK ads.

I've mentioned the Owl previously in the hope that someone might still have a copy of the plan, but few even remembered it. In recent years, I've thought that an Owl might make a nice companion piece to two other British twin fin gliders, the Keil Kraft 'Nomad' and FROG 'Wren'.

Then, earlier this year, I received a mail from local friend Simon Rogers, whose collecting skills regularly turn up modelling treasure. Simon knew I'd be pleased when he announced that he'd found a complete, boxed Owl kit on an online auction site and successfully bid for it. The kit showed PK's usual standard of kitting, though with some rather heavy wood. I gratefully accepted a copy of the plan. One of my modelling quests was finally over!

This summer, we discussed the Owl with Dereck Foxwell of the Old School Model Aeroplane Factory. He was taken with the design, especially its relative obscurity. He wondered if it might be a suitable subject for a future OSMAF laser-cut short kit.

We supplied Derek with plans and templates, and when we next saw him, a few weeks later, he presented Simon and me with beautifully cut trial kits of components. Needless to say, Simon's Owl was built in a few days and I witnessed its test flights. Its glide is superb and it likes lift. Next season, mine should be built and possibly many others if Derek decides to put it into production.

If you've been a secret Owl fan all these years, you could drop him a mail and enquire about the possibility of kits. If it happens, I'm ready to start an Owl gallery here...

Malmström Movie Magic

Another beautifully emotive movie clip was also brought to our attention just after the KK footage appeared. Thanks to the late Ray Malmström's long established club, the Impington Village College MAC, a video from 1992 of Ray on the flying field with the club has been posted on YouTube.

In it, Ray is flying some of his famous rubber designs, which are expertly trimmed and put in some long flights. Ray is heard chatting and joking with his clubmates and a recent viewer of the video has remarked that the good humour and laughter on the club's flying field could be a lesson to many more 'serious' ones today.

These fleeting images of Ray in action were taken during the final decade of his life and early fans of his beginners' designs who, like me, never got the chance to meet him, will be more than pleased to see this one. Follow the link in the Contacts box...

CONTACTS

KEIL KRAFT FACTORY VIDEO:
https://youtu.be/nlhs0ltNwK8

RAY MALMSTROM VIDEO:
https://youtu.be/UeXCcLtDWkw

RUBBER POWER SHACKLETON VIDEO:
https://youtu.be/ZEBLy0YpMCg

OLD SCHOOL MODEL AEROPLANE FACTORY:
theosmaf@gmail.com

Left: The late Ray Malmström, modeller, educator and inspiration to generations of modellers. Fans of Ray and his work can now see a video clip online of the great man in action on the flying field in the 1990s (Copyright/acknowledgement IVCMAC)

Shack On The Meadow

Another topic which brings in mail from last time is giant free flight rubber scale models. Indeed, in November's edition, the entrants in the Top Gun 2016 F/F Mass Launch (won by Dave Platt) received some excellent coverage.

I needed little convincing about the genre when my Comet kits arrived from Ron Baddorf in the States but I was totally sold on it after a visit to the Oxford MFC's 'Scale Fest' in October at their well-known Port Meadow site. This last event in the OMFC's calendar enjoyed some text book late summer condition - very light winds with sun and intermittent cloud through the day. Oxford meetings always attract major talent from all fields of UK free flight.

Competition at the Scale Fest classes covered rubber, electric, CO2, diesel, jet and glider. The standard of building, flying and trimming were inspirational, across the board. This late in the season it was a huge privilege to see a truly epic rubber scale model in action.

Monique Lyons brought her own design, scratch built, 60" span Shackleton to compete. The model is of traditional stick and tissue construction and took about a year to complete. First flown in 2015, the Shackleton had made a series successful trimming flights, but at Oxford this year Monique had the opportunity to experiment with its motors and increasing the turns during its competition flights.

The model is full of neat design features. Even winding the four rubber motors is an ingenious procedure. The detachable outer wing panels and nacelles are detached, while the two inners, attached to the centre section on the fuselage, are wound first. The outers are wound separately, then reattached. All the props are held static by a simple wire pin gadget that releases them simultaneously at launch.

Through the day, the Shack' made increasingly longer flights and looked utterly majestic, undoubtedly a real crowd-pleaser. I was startled to find that I'd managed to capture a lucky flying shot during a climb out that must rank as one of the best I've ever taken! I offer it here.

I hope to see the Shackleton in the air again next season. All done without radio, guys! Some videos of it are online (along with other Oxford entries), so check them out.

Monique is a formidable F/F scale modeller and competitor, and she's currently the UK Indoor Kit Scale Champion. She told me that some other exceptional projects are underway for next year, so you'll undoubtedly see them here.

Contributions, please, to The Sport Channel, c/o the Traplet Publications address. All Email correspondence to: gray_rcmag@hotmail.com **RCMW**

Monique's Shackleton caught during climb out by your author's lucky camera work!

Monique Lyons prepares to launch her extraordinary giant F/F rubber scale Shackleton on Port Meadow in Oxford. Props are released simultaneously with a gadget held near the nose. Impressive and realistic in the air

Check our website for a full list of events
www.rcmodelworld.com

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INDOOR

26th Nov '16, 21st Jan, 18th Feb, 18th Mar '17
Waltham Chase Aeromodellers Indoor R/C Meetings, at Fleming Park Leisure Centre, Passfield Avenue, Eastleigh, Hants SO50 9NL. Each event will run from 7 pm to 10 pm. The Main Hall at Fleming Park Leisure Centre is a ten badminton court size sports hall, with a very high and obstruction free ceiling, and is particularly suitable for lightweight indoor R/C models. Please note that free-flight models may not be flown at this meeting. Admission to each meeting will be £8 for flyers and £1 for spectators, whilst accompanied children will be admitted free. Junior flyers will be charged as adult 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

29th Nov '16, 27th Dec '16, 31st Jan, 28th Feb, 28th Mar, 25th Apr, 30th May, 27th Jun '17
Waltham Chase Aeromodellers Small Indoor R/C Model Meeting, at the Main Hall at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. All meetings will run from 7 pm to 9.30 pm. This is the venue at which we hold our popular indoor F/F meetings, the hall is not large enough for conventional shock flyers, but has proved suitable for smaller indoor R/C models. Models to be flown at these meetings are to be limited to a maximum weight of 95 g (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, whilst accompanied children will be admitted free. Junior flyers will be charged as adult 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

3rd Dec '16
Fun Flying at Potters Bar, at Furzefield 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

10th Dec '16
North London MFC Indoor R/C Meetings, at Furzefield 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

10th Dec '16, 7th Jan, 4th Feb, 4th Mar '17
Waltham Chase Aeromodellers Indoor Meetings, held in the Main Hall at Havant Leisure Centre, Civic Centre Road, Havant, Hants PO9 2AY. The events will run from 7 pm to 10 pm. Please note that free-flight models may not be flown at these meetings. Admission to each meeting will be £7 for flyers and £1 for spectators, whilst accompanied children will be admitted free. Junior flyers will be charged as adult 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

13th Dec '16
Waltham Chase Aeromodellers Indoor R/C FPV Meeting, the meeting will run from 7 pm to 9 pm. Should the trial event be successful, the club will hold a series of indoor FPV focused events intended to provide a more suitable forum for these types of vehicles than general indoor flying. Initially the aspiration is to hold a number of short brushed motor equipped micro FPV (e.g. 'Tiny Whoop') Multirotor Races and challenges, e.g. spot landings and obstacle courses, however the format of these trial events will be developed following attendees' input. Models to be flown at these meetings are to be limited to a maximum weight of 95 g (3.5 oz), in-flight trim, including battery (not to exceed a 2-cell LiPo pack). Helicopters are to be limited to a rotor diameter of 6" (152 mm). Multicopters are to have a motor to motor diameter not exceeding 6" (152 mm). More details can be found on the website. Admission to the meetings will be £4 for flyers and £1 for spectators, whilst accompanied children will be admitted free. Junior flyers will be charged as adult 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

GENERAL

20th Nov '16
Southern Counties Swap Meet at Mountbatten School, Romsey, Hampshire SO51 5SY. Admission only £4, under 16s free. Tables £8 including one admission. Sellers from 8.30 am, buyers 9 am to noon. More details at hmfa.bmfa.org/ To pre-book tables only call Mike Stokes on 07702 742647

4th Dec '16
Loughborough Model Flying Club 19th Annual Swapmeet, at Rawlins Acedemy, Loughborough Road, Quorn, Nr. Loughborough, Leics LE12 8DZ (directions on www.lmfc.net). Sellers set up 9 am, open to public 10 am. Hot & cold refreshments available. Tables £4, Admission £3, early table pre-booking is essential to avoid disappointment. For more details contact Richard on 07400 921929

10th/11th Dec '16
Garden of England Modelfest, hosted by the Modelfest club (in aid of Hospice Care for Children), at Coolings Garden Centre, Rushmore Hill, Knockholt, Sevenoak TN14 7NN, from 10 am to 4pm. The show embraces the skills of those who construct Boats and Ships; Architectural models; Radio Control Trucks, earth movers and other vehicles; Dolls Houses & Miniature scenes; Model Railways; Model; Meccano; Sci-fi figures; Military models; Model Engineering; Model aircraft and much, much more. It will be a feast of delight for families and enthusiasts alike, with modelling from a wide variety of genres to inspire and delight. Admission: Adults £5. Children under 14 go FREE (when accompanied by a fee paying adult). Contact/futher details: gardenofenglandmodelfest@gmail.com Website: www.gardenofenglandmodelfest.co.uk/

8th Jan '17
Croydon Airport Military & Aviation Collectors Fair, at the Hallmark Hotel, Purley Way, Croydon Surrey CR9 4LT (see the link for directions: www.hallmarkhotels.co.uk/our_hotels/croydon/location/). Items available are: Aviation Collectables, Book Dealers, Model Collectors, Uniform, Medals, Toys, Kits etc. Doors open at 10:30 am, £3.50 Entry, Children under 10 free. Free car parking. Traders contact Aviation Antiques on 07973 885754, stalls plots to be pre-booked. Croydon Airport Control Tower open for visits. For more details contact Dave Sutton, Email: davidsutton16@aol.com Mobile: 07973 885754

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Vintage Modellers: Aeromodeller annual 1959 and Control Line manual by R.G. Moulton (1961). Both in good condition, £10 the pair, including postage. Call 01772 684244. Lancs.

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MODEL WORLD

Next Issue

DON'T MISS OUR JANUARY 2017 ISSUE!

Cri-Cri Capers

Like all scale modellers, John Higgins has a wish list of aircraft that he wants to build. Models built so far have included an Evans VP1 Volksplane, followed by an obsession with the Zlin 526. Quarter-scale glass gliders followed, and then he saw a lovely third scale CAP 21 at Old Warden, so onto the wish list it went! More recently his Corby Starlet, which has been featured several times in RCMW, took to the skies, being completed in 2012. Several years ago he stumbled across an aircraft that really tickled his fancy – the Cri-Cri! This twin engined aeroplane was designed in 1971 by Michel Colomban and is really tiny, spanning just 4.9 metres. These days all of John's projects are electric powered and whilst researching the aircraft he came across a full size electric Cri-Cri that set the record of being the world's fastest electric aeroplane back in 2010. A perfect choice! In an entertaining article, John writes about his discovery of the electric Cri-Cri and his journey to make an R/C model of it to 47% scale – just the right size to fit into his estate car!

Delightful Dalotel

Building a scale model takes more time than creating a sport plane, which means that they can become molly-coddled and rarely flown in anything but perfect conditions. Wouldn't it be nice if a scale plane could be built for the price of a small ARTF and could go out in most weather conditions? It might also be nice if it wasn't an Extra or an Edge! That is where a Dalotel DM-165 built from the Traplet wood pack WP3541 comes in. It has positive flying characteristics, despite large control surfaces, and the proportions make it easy to transport and inexpensive to build. When first designed by Peter Miller the Dalotel used a .32 glow engine but one of the joys of building your own from a kit of parts is that you can fit it out however you like. This new version is fitted with an Axi 2826/12, so is a bit more powerful than the original, and a 4S-3700 LiPo battery gives about eight minutes of mixed flying time. In this, the first in a new series of build articles, Peter Maw will look at building the Dalotel specifically, however many of the construction techniques and tips will be useful for any model being built from scratch.

JANUARY 2017 ISSUE ON SALE THURSDAY 15TH DECEMBER

Bergfalke Mu13

As kits go the Bergfalke Mu13 scale glider from aero-naut is an impressive offering, spanning some 3.5 metres, which works out at just over 1/5th scale. The full size went into production as the Mu13D just before World War 2, in the late 1930s, with the Mu13E being produced post-war as a tandem two seater. This was later developed into the Scheibe Bergfalke series of trainers. In his review, Frank Skilbeck finds that this all wooden scale glider is a joy to build and a pleasure to fly, whether launched from the slope or aerotowed, as can be seen in the accompanying picture.

PLUS... *More features, columns and reviews from across the complete spectrum of the R/C model-flying hobby*

All contents are subject to change without notice

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Ripmax

WOT 4 Mk2 -E

BY CHRIS FOSS

Part No: A-CF003A

SSP: £109.99

The overwhelming popularity of the original Wot-4E meant that a new version was always on the cards, and through working closely with Chris Foss this new model has a revised lightweight structure plus a bright new colour scheme. Being an 80% scale example of the ubiquitous Wot 4, the Wot 4E is the perfect size to use commonplace 3 cell 2100-2500mAh batteries.

The Wot4-E is a brilliant all around model that is ideal for small field use, yet it is large enough to hold its own at the busiest of flying sites. The prebuilt balsa/ply structure is both strong and lightweight and covered in a bright iron-on film so only minimal assembly and installation of the motor and electronics is required.

With the same great flying characteristics as its larger brother this really is a superb performing sport aerobatic aircraft, with the thick wing section being very forgiving at low speed.

Specification:

Wingspan: 1095mm (43.1")
Length: 1055mm (41.5")
Weight: 1420g (50.5 oz)
Servos: 4 Mini (Required)
Radio System: 4-5 Channel (Required)
LiPo Battery: 3S1P 11.1V 2200mAh (Recommend)
Speed Controller: Quantum 40A Brushless (Recommend)
Electric Motor: Quantum II 36 Brushless (Recommend)

Ripmax

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