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MAY 2015

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FLIGHT  
ARTICLES**



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**PLAN  
FEATURE!**

**FOURNIER RF-7**

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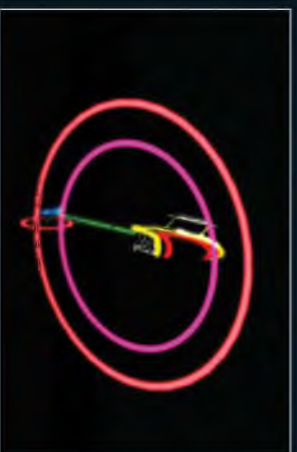


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RC  
**MODEL  
WORLD**

MAY 2015 • ISSUE #376



Florida Jets is the start of season scale model flying event held at Paradise Field in Lakeland Florida. Dedicated to turbine powered models, it attracts some of the best sport and scale jet modellers from all over the USA and other parts of the world to fly their powerful models from a dedicated R/C flying strip. Barry Vaught photographed many of the jets in action and you can read his report starting on page 98

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After reading Chris Freeman's article about the Freeman family's Fourniers, we thought it would be good to give another airing to one of the most popular versions of this iconic French motor glider that we have in the Traplet plans range. So please welcome back Peter Miller's 1/6th scale RF-7, a 62-inch wingspan, clipped wing version for .26 – .32 four-stroke or .15 – .20 two-stroke engines

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Over a decade ago, Tony Wright sketched out a design for a high wing, electric powered trainer. He called it Bob but it was never built. Roll on eleven years and he had the perfect answer when his daughter decided she wanted her very own R/C aeroplane. The 44-inch span cabin model, designed to take a 3S-1500 mAh LiPo, was even renamed in her honour!

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Barry Vaught reports from the season opening Florida Jets event held in Lakeland, Florida. This top turbine gathering attracts many of the best R/C pilots from around the world, including our very own Ali Machinchy, who flew the largest jet to ever participate at this event – a custom built, 1/4 scale, 177-inch long F-104 Starfighter!





# PRE-FLIGHT

**W**elcome to the May issue of RC Model World. Maybe it's because it is so easy to get a decent weather forecast these days using apps on my phone, but I do find myself being much more picky about when it is suitable to go flying. In 'the good old days' I would head out pretty much regardless of the conditions, and it would only be actual rain that would stop me. But now the mere sight of a rain symbol on my phone is enough to stop me walking out to the shed to charge some batteries.

And then there's the wind... Is it me or is it really a lot windier these days, especially over the winter months? It certainly seems to have put a stop to a lot of kit review photo sessions that we have had planned this year. But then, of course, it quietsens right down when the magazine's schedule ties me up in the office! Or am I paying far too much attention to those weather apps again?

Or maybe I am just starting to develop (finally, Mrs C would probably say!) some common sense when it comes to my own weekend flying sessions, of which there have been far too few of late for my liking. Yes, I've done it all – wasted countless hours with rain dripping off my nose and the models never getting out of the car, or flying in snow and ripping the undercarriage smartly off when the white stuff acted as a big, soft, arrester net.

And then there was the time, after just having learnt to fly helicopters, that I thought I had finally found a way to beat fog, only to end up with rime ice forming so quickly on the rotor blades that my poor old Shuttle wouldn't even rise up more than an inch or two!

So, much as I hate to admit it, I probably should give those handy weather apps much more credit than I currently do, as they usually turn out to be right, give or take an hour or two.

I mention all this as last weekend the conditions were pretty much perfect. But having been out visiting relatives the day before, I was a wee bit unprepared. So I rose nice and early in order to quickly charge some 3S cells and bundled the small Hobbyzone Corsair and a JR Forza helicopter into the car. And I had a whale of a time, with the Forza getting the adrenalin pumping and the Corsair scampering all over the sky.

The Corsair is fitted with SAFE technology, which when fully engaged turns the responsive foam warbird into a meek kitten. This still fascinates me and I'll often use over half the pack stooging her around on rudder alone, much like a guided free flight model. When the conditions are right for such relaxed flying it reminds me that there is a lot to be said for getting back to basics when flying our models and just enjoying the simple pleasures of gently guiding a model around the sky using the bare minimum of controls.

With this in mind it gives me great pleasure to introduce you to our free pull-out plan this month, which is a back to basics, no frills, electric powered cabin sports model, the Millie Bob. Quick to build, you should have no trouble at all in getting one of these ready for those long, hot and still summer evenings to come. Did I just say 'hot and still'? Oh, dear, I do hope I haven't jinxed it...

Our other plan feature this month is one that you may have seen before in the form of Peter Miller's glow powered Fournier RF-7. We have resurrected this popular plan as it makes the perfect accompaniment to a special article that South African modeller, Chris Freeman has sent us about the trials and tribulations that his son had to overcome when building and flying his first true scale model.

On review we take a look at the build of a Weston Capiche 52, as well as relishing the low speed aerobatics that the new Precision Aerobatic XR-52 is capable of. We also have a wide spread of product reviews in this issue, starting with the impressive Tactic TTX650 six channel radio, which offers mid-range programming at just over £110!

We also finally manage to beat the wind to shoot some impressive aerial video footage with the new Parrot Bebop drone, and we also take in an overview of a truly gorgeous piece of model engineering in the form of a Saito FG-40 four-stroke petrol engine.

Other features in this issue include a full report from the recent Florida Jets meet, more hi-tech products are analysed in our Gadgets & Gear column, and we take a tour of The Fleet Air Arm Museum at Yeovilton to look at another collection of aircraft, some of which would make perfect R/C scale models.

Happy flying!

*Kerin*

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## Kevin Crozier

Editor | **Radio Control Model World**

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### LADY EOWYN



Richard Acland of Chepstow, who flies with the Forest Radio Model Club in Gloucestershire, is the latest reader to contribute pictures of a recently completed model to our on-going gallery of aircraft built from drawings in the Traplet Plans range.

Richard writes:

*"I am attaching some pictures of my recently completed 'Lady Eowyn 2', built from plan MW3230, designed by Peter Allanson.*

*I have had this plan for many years, as it was originally published in RCMW in November 2006. Every so often I would look at the plan, as it such a lovely looking model, and say to myself, "I really must build this sometime." And then it would be placed back in the plans drawer again.*

*But in May 2014 I took it out and decided that it was now or never. Balsa wood was ordered and work commenced. As with most of my building I deviated somewhat from the plan with my construction techniques. In this case I altered the tailplane, fin and undercarriage construction. Also, the cowl is built up from balsa and ply.*

*I wanted to have some form of on-board glow driver to assist in slow running of the SC four - stroke. I looked at many commercial units but as I have a mechanical/electrical background, I decided to build my own – much more satisfying! I purchased a roller arm micro switch, a 1.5V 3000 mA sub-C battery and a small on/off switch. I made a small cam to fit on the throttle servo arm so that when the throttle is closed to about a third, the micro switch closes and sends power to the glow plug. I realise that this it not new but it does make starting a lot easier. Prime engine, switch on glow circuit, back off to low throttle and apply electric starter – and away you go!*

*As yet the model is unflown as I am awaiting some nice dry, warm weather."*

Best of luck with the test flights, Richard. She looks lovely. And do let us know how you get on. By the time our readers see your pictures hopefully we can all be out flying again on a regular basis, rather than using kites as our main way of getting some flying fun!

Although not a model aircraft kit, this product is perfect for inspiring children to take an interest in engineering and mechanics. And it could help them understand what is happening when you flick a retract switch too!

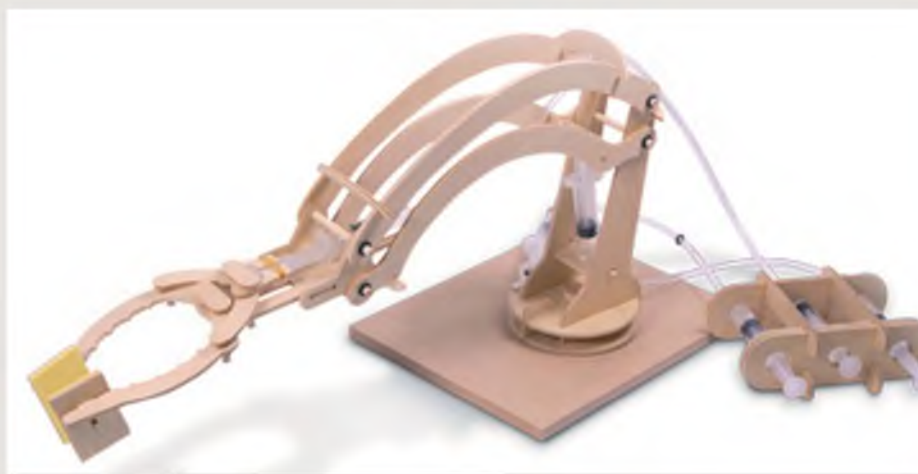
This 'Hydraulic Robotic Arm' kit takes around two hours to build and will help those who assemble it to learn the basics of hydraulics. It is brand new from Thumbs Up UK.

It is easy to construct for children and adults alike, and the 3-D model is a great demonstration of a hydraulic power system. The arm function uses some of the same principles that drive real world machines; it can lift small items horizontally and rotate them by 90°. Made from die-cut plywood, the frame stands at 37 cm high and stretches up to 49 cm. Best of all, it needs no batteries – simply add water to put it to the test!

### ROBOTIC HELPING HAND

For ages eight and above, the 'Hydraulic Robotic Arm' kit costs £18.95 from Genie Gadgets:

<http://www.geniegadgets.com/hydraulic-robotic-arm-kit.html>





## BELL BOY IN FLIGHT

First featured in Take Off, February 2015, Dave Warren has sent flying pictures of his Skygipsy inspired Bell Boy design:

"Hello Kevin,

You will recall the photographs of the model I based on Ray Malmstrom's Skygipsy, which you kindly published in RCMW.

I attach photographs showing the model in flight, piloted by my mate, Les, for whom the model was made. It flew very well without needing any alterations.



In fact it has a stunning spiral climb reminiscent of Free Flight contest power models. And this on a cheap and small bell motor and a 850 mAh 2-cell LiPo. Loops are a doddle. Clearly Ray Malmstrom knew what he was doing.

The chap on the right is Les, and I'm about to congratulate him on his first flight with it."

Thank you, Dave. We would like to add our congratulations too. And we hope that the spiky looking, dried undergrowth didn't puncture your wing covering too much!



## DEVCAD UPDATE

Early last year we reviewed Profili 2, which is an aerofoil design/selection software package aimed at modellers with an interest in Computer Aided Design. Stefano Duranti, the man behind this product and the devCad range of software, has sent in an update about his latest range of modelling software:

"Since Profili was born in 1998, I developed many new applications to fulfill the never ending requests of aeromodellers. Starting from a simple application, written by myself to build a wing, we have now the (probably) most complete collection of applications for aeromodellers. This year, for example, there are new applications to create moulds for wings, fuselages and other parts:

devWing Mold – to create wing plugs and moulds: <http://www.devcad.com/eng/devwingmold.asp>

devFus Mold – to create fuselage (and similar parts) plugs and moulds: <http://www.devcad.com/eng/devfusmold.asp>

devStl Tools – to create, edit and process 3D STL files: <http://www.devcad.com/eng/devstltools.asp>

At <http://www.devcad.com/eng/products.asp> you can find a list of all the applications, with a brief description of the included features. You can download and try/evaluate them.

The devWing series of applications offers an improved approach and many advanced features with respect to the wing Cad/Cam part of Profili Pro. Profili Pro still exists as a generic tool able to draw and cut simple wings. It also includes features for airfoil analysis, editing and improvement, so it is still a live project.

Single program licenses are available at:

<http://www.devcad.com/eng/prices.asp>

You can also purchase bundles of applications at a discounted price. See: <http://www.devcad.com/eng/bundles.asp>

To get assistance and to view the most frequently asked questions you can now subscribe (for free) to our forum: <http://devcad.forumfree.it> (english language)

Finally, you can see here a brief list of applications that will be coming soon:

devWing Foam – to cut complex foam wings using a 4-axis CNC hot wire machine

devFoam RA – to cut complex parts using a CNC hot wire machine with 4-axis and a rotary axis (vertical, horizontal or simulated by hand)"

## TRAPLET REMINDER NO.1

Traplet Publications have a new address...

Just a quick reminder that Traplet Publications have moved to new offices near to Welland in Worcestershire.

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Our new address is:

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## TRAPLET REMINDER NO.2

Traplet Scale dates and venues announced...

The venues for this year's Traplet Scale events are the Pontefract and District Aeromodellers site (WF8 4QD) on Sunday May 17 and the Bickershaw MFC site (WN2 5TD) on Sunday August 9. Both events start at 10 am.

Flying schedules and further information for both events can be obtained by contacting Peter Maw by email at: [secretary@bickershawmfc.co.uk](mailto:secretary@bickershawmfc.co.uk)

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



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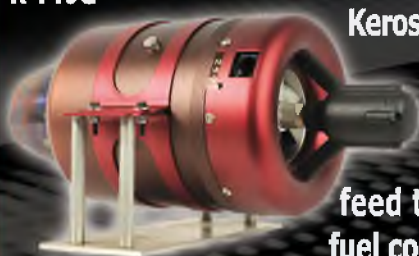
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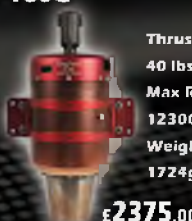
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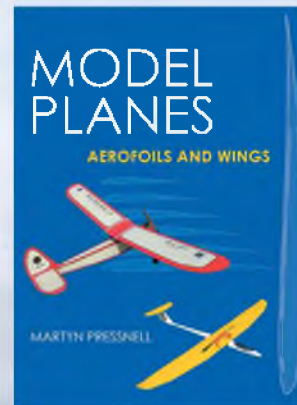


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Succeeding chapters introduce descriptions of lift generation, understanding aerofoil characteristics, boundary layer development, Reynolds numbers, sources of drag and more. [sales@halebooks.com](mailto:sales@halebooks.com)



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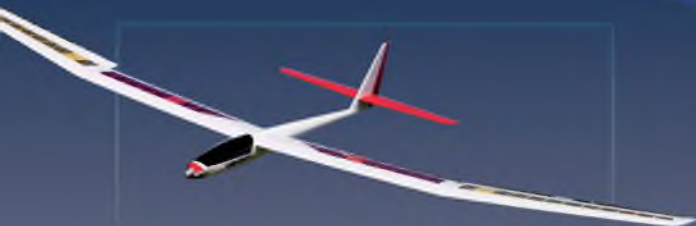
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(EFL4915)



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### **Spektrum DX9 Transmitter**

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# XR-52



*When faced with the option of reviewing his fourth Precision Aerobatics kit, Dave Wilshire needed a short while to make a decision. No prizes for guessing his final answer!*



**W**hen I was asked whether I was interested in reviewing Precision Aerobatics' latest offering, I considered whether it was a good idea that someone who has reviewed PA's three previous designs should build another. I then decided it was perfect, as I would be able to compare this latest design with my previous knowledge of what could be expected.

PA kits are always well packed, with a conventional box inside an outer sleeve. Double protection, and each part is suitably packed and sectioned off. The cowl and spats are wrapped in foam in their own section and accessories like the carbon wing spar are attached to the side of the box. The main parts are in clear bags so you can see everything when you start to unpack. The system works as I've not experienced a damaged PA kit.

is braced with laminations of carbon to keep the area between the plug in wings from flexing. Even the fuselage longerons have a carbon rod let in to them. The undercarriage legs are carbon and so are light weight and unlikely to collapse.

Spend some time just staring at the construction and you notice different touches. The aileron has a neatly designed carbon D moulding with the hinges inset. This keeps the ailerons nice and stiff along their length. The wing trailing edge has a built up hinge line that creates a recess for the aileron to sit in; this gives a very clean break between the wing and the surface. This is all completed at the factory, so each wing is almost ready to fit a servo and the aileron linkage.

The tail surfaces are constructed with a symmetrical aerofoil section. This almost certainly adds to the flying qualities and is

The fuselage is constructed in such a way to keep the weight to a bare minimum, but still rigid. An airframe where the fuselage is flexing during large rudder inputs causes other issues (if the fuselage twists, the rudder starts to act as an elevator!) and it will never fly straight. This hatch is sheeted in balsa over a lightweight frame. The canopy 'glass' is factory fitted and smoked brown, which adds to the quality look. Two pegs at the front and four magnets at the rear secure the hatch. It shuts with a positive 'snap'.

Accessories supplied are all good quality, with carbon control horns and pushrods. The linkages use an aluminium CNC machined clevis for the control horn and a plastic ball link for the servo. These minimise control surface slop. Obviously, good quality servos are required (see later).

The optional extras offered by PA are all high quality and are well suited to the various aeroplanes they produce. The team at PA spend a lot of time fine-tuning the designs before releasing them. Balance position is giving to the half mm! So follow the manual, as you are just wasting time trying your own ideas. There are also a series of build videos that demonstrate all the steps on the PA website, in the 'How To' section.

### Assembly

I started assembly with the wings.

Before doing anything else I always check the wing fit and their alignment on the fuselage. Other than chamfering the end of the carbon wing tube no other work was required for a perfect fit. One minor niggle was the openings in the fuselage for the aileron servo lead, which if opened fully projected just below the wing's lower surface.

I plugged in my covering iron before cutting the servo openings. I always iron the film to the surrounding structure before cutting out the opening. This stops the film pulling away during any later tightening of the film. My kit was wrinkle free, but previous experience with the Katana MX has shown it worth spending some time on the wing trailing edge as there is little overlap.

PA offer extended carbon servo arms to double up on the plastic arms. They help resist any twisting from the ball links. These can be ordered as an option.

Carbon control horns will require the clevis screw hole to be opened out; if you don't have a 1.9 mm drill use a pointed file, gently twisted. This is best done before gluing the horn in position.

My choice of KST 115 servos required a small notch to clear the lead and a short extension lead to get it past the wing root. Centring the servos with my JR XG8 before fitting the arms minimised the sub trim needed.

Assembling the control linkages, I bonded the carbon rod into the ball link then adjusted the overall length before bonding it into the aluminium clevis with epoxy. Take the outer coating off the carbon before bonding using fine glass paper and notch as instructed.



*Simply by changing the prop XR-52 can be transformed from a smooth aerobatic ship to an all-out 3-D fun flyer*

This is another NEXT generation model, with flying characteristics that suit varying flying styles from smooth precision aerobatics to full 3-D. I looked at the pre release videos and it seemed wild! Playing with the surfaces when I had it in my hands, I must admit I was expecting a little more movement. But it was obviously designed like this, so OK, let's build!

PA are well known for their patented construction method using FibreFusion, where carbon is integrated with the balsa and heavily lightened plywood. This ensures the open construction stays stiff and the balsa framed control surfaces don't distort too much.

There is a lot of carbon in this aeroplane; the wing tube and sockets are carbon, the trays are carbon skinned and the cross structure in the fuselage hatch area

not as easy to manufacture as a flat plate design. The hinges for the tail are mylar CA type, sealed with a strip of film to ensure maximum control power. The slots are cut but you do need to glue them into position. I CA glued the outer two first and then set the gap equally before fixing the inner pair. Also the hinge gap seems large until the film seal is added; I presume the guys found a bonus in control power from this set up - because it works!

Following PA's usual practice the tailplane locks into the fuselage slot using a stepped key arrangement. This makes alignment easy. You need to cut a section out of the rear fuselage to allow the tail to be slid into position. A wooden block is provided, but careful cutting of the section being removed means that it can be reused.





The section behind the tailplane cut-out needs to be cut away to fit the tailplane

### Fuselage

Following my normal practice I decided to complete the undercarriage legs with the wheels and spats, and then mount them so I could stand the fuselage clear of the work bench and sharp objects while I worked on it.

My wheels spats fitted perfectly, with a small chamfer on the leg. A single self-tapping screw holds the spat to the leg. Additionally I used some silicone glue to remove any chance of them shaking loose.

I always fit the motor assembly before working on the tail. It reduces the chance of damaging the fragile surfaces.

The motor and ESC are housed in a separate motor box. This allows them to be installed without manhandling the whole fuselage in a tight workshop.

The carbon/plywood motor plate is ready to accept the recommended Thrust 45 motor. This motor has been developed by PA to achieve a targeted performance and a high power to weight ratio. The mounting holes are pre-drilled and, as expected, the four mounting screws lined up perfectly.

PA increase rigidity by adding carbon rods to the motor box/fuselage joint. I used a mixture of CA and epoxy to attach the structure, ending up with a very strong assembly.

I also decided to fit the cowling at this stage. There are four fixing tabs built into the fuselage sides (these are also carbon faced!) Dry fitting the cowl showed the need to notch the lower corners and to lightly chamfer the rear face. This allowed the cowling to sit in position without stressing it.

I used the 2.17" carbon spinner with aluminium backplate recommended for the XR-52 to align the cowling. The quality is superb and it ran true from the first fitting. The motor box has side thrust built in and the cowl was easily aligned. I read through the Vox prop options mentioned in the manual and decided on the 13" x 6.5", as I prefer the instant bite offered by more pitch.

*(PA emphasise the XR-52's versatile flight characteristics, which can be altered simply by changing the propeller. It makes a big difference depending on the type of flying you prefer, from smooth aeros to all out 3-D. Again you can watch the videos on the PA website to see the difference that a change of prop makes – KC)*

With the front end complete I turned my attention to the rear. The elevator and rudder require the hinges fixing in position. The rudder has two smaller hinges for the upper two slots and a wider lower hinge to take the tail wheel loads; this is fitted to the base of the rudder with epoxy.

You can complete the tailplane before fitting as it's fitted from the rear once the small section of fuselage is removed. I refitted this section before attaching the rudder. My tailplane sat perfectly square with no work. I used white glue to fit the tail as it allows any excess to be wiped off with a damp cloth.

Both the servos are fitted at the tail end. 300 mm extension leads were required with the KST servos used. The pushrods were made in the same way as for the ailerons, after checking the length.

I prefer to leave short extension leads attached to the Rx for making aileron connections; JR have a 70 mm lead that is perfect for this. However, the XR-52 is just the right size to leave together in my people mover so most of the time the wings will stay on.

PA provide instructions for control movements, expo and balance point. Follow these as they really know what they are doing. You are almost guaranteed success if you do as you are told!

### Setting Up

PA supply a control movement gauge to help with setting up the travels. I set my JR DMSS XG8's option of three rate modes to cover maximum and minimum movements, other than rudder, which is just maxed out!

I like to fly high rates just about all of the time but having the option to experiment is good. During set up I used the D/R (Dual Rate) function to adjust the actual movement in each direction.



Hinge lines are sealed with a strip of film to ensure maximum control power



PA kits are well known for their FibreFusion construction, where carbon is integrated with balsa and heavily lightened plywood



Rigidity is increased by adding carbon rods to the motor box/fuselage joint



The carbon/plywood motor plate is ready to accept the recommended Thrust 45 motor. The mounting holes are pre-drilled and the four mounting screws lined up perfectly



Linkages use an aluminium CNC machined clevis for the carbon control horn and a plastic ball link for the servo arm to minimise slop at the control surface



Once I had finished the set up I fitted the vortex generator pack using ZAP Canopy Glue, as this allows plenty of time and is an adhesive that is easily wiped off before it is dry.

### First Flights

The manual recommends 3.3 kg/cm torque servos but my first flying session was with my favourite 2.0 kg servos on all surfaces. It showed what a fabulous airframe this was, but I could feel it was not as crisp or as positive as I expected. The 2.0 kg torque of these servos just wasn't enough for the huge control surfaces.

Initially I thought that the ailerons were coping OK, so for the second flying session I just changed the elevator and rudder servos for KST 115 servos at 3.1 kg torque. These are also distributed by MacGregor Industries and only require a little trimming of the servo opening to drop in.

The improvement in tail control was instant and the XR-52 came alive with some wild knife-edge spins now being possible and even better knife-edge loops. But the ailerons were definitely lacking now! So I ordered another pair of KST 115s for the ailerons. Suffice to say, the XR-52 requires a minimum of 3.0 kg torque servos! So the flying review really starts here.

Some manufacturers ignore any mention of any mixes required, I guess choosing to pretend that their model doesn't need any. Precision Aerobatics instructions are very complete and the omission of mixes is actually because the design is rigged not to require any! XR-52 is actually one of the most neutral designs I have ever flown. The early 'proving' flights had shown hands off level flight when upright and inverted at around half power, so it follows that multiple rolls are very easy with none of the usual nose dropping and constant elevator working. It does still need a little rudder work during the wing vertical stages; as several people have noted the XR-52 has been designed with a sleek fuselage side profile. Due to the light weight this makes little impact on the flight envelope and slow knife-edge passes are easy, only requiring throttle inputs to change the height.

Power is amazing. Climbing from a prop hang, the XR-52 accelerates constantly and never seems to slow down! Blenders are wild and, as already mentioned, the knife-edge spins are a blur. The XR-52 feels really light in the air; it floats over waterfalls (end over end tumbles) and stops dead in 'wall' manoeuvres. Rolling harriers are the easiest to control; I've always found anticlockwise orbits easy, but being lazy I'd never cracked the clockwise circuits. But the XR-52 has allowed a few reasonable efforts. I enjoy flying it so much I have taken it flying every weekend since it was finished.

It really encourages you to master areas of your flying that you usually avoid. And it's such a pleasure to fly that I have regularly used all six of my 4S 2200 packs in this one airframe. I generally take a couple of models to share the same pack size, but this model is making me have the need for more packs!



*With maximum control throws there are no prizes for guessing Dave's preferred flying style! But PA are keen to point out that the XR-52 is equally good at smooth aerobatics too*



*Banking round in a rare moment using minimal control throws*



*Early 'proving' flights showed hands off level flight when upright and inverted at around half power*



*Climbing away after a low inverted pass. When fitted with a PA Thrust 45 motor the XR-52 exhibits a high power to weight ratio*



## Conclusion

The same applies to any of PA's designs – a pilot with a couple of models' experience will have no problem flying the XR-52. Set it with small control movements and it's a smooth, easy to fly airframe. It's strong, but the structure is not designed for rough landings, hence some experience is needed.

I've managed to get a lot of flights in while writing this review and the XR-52 has caused me a few problems. I never expected it to be so good, so other favourites are being left hanging in the office...

XR-52 from Precision Aerobatics is highly recommended. **RCMW**



*The wing mounted carbon vortex generators aid slow flight*



*Pulling up, XR-52 shows off her lightweight construction through the translucent covering*

**MODEL  
WORLD**

## DETAILS

### MODEL INFORMATION

<b>MODEL NAME:</b>	XR-52
<b>MANUFACTURER:</b>	Precision Aerobatics
<b>DISTRIBUTOR:</b>	MacGregor Industries Ltd
<b>PRICE:</b>	£219.95 SRP
<b>MOTOR:</b>	PA Thrust 45, with RotorKool
<b>ESC:</b>	PA Quantum 45, with SBEC
<b>POP:</b>	Vox wooden 13" x 5" or 13" x 6.5"
<b>BATTERY:</b>	4S 2200
<b>WINGSPAN:</b>	1321 mm
<b>LENGTH:</b>	1243 mm
<b>APPROX WEIGHT:</b>	1395 g RTF

### DISLIKES

- I'm struggling to think of anything I didn't like.
- Mine did need a couple of peeps of aileron trim!

### LIKES

- Performance on a small 4S pack is amazing, as are its flying qualities



*Slow knife-edge passes are easy, only requiring throttle inputs to change the height*



# XR 52

PRECISION  
AEROBATICS



## SPECIFICATIONS

Wingspan: 1321mm / 52in

Length: 1243mm / 48.94in

Wing Area: 586.3 sq.in

## ADDICTION

### SPECIFICATIONS

Wingspan: 1000mm / 39.5in

Length: 1063mm / 41.85in

Wing Area: 485 sq.inch



### SPECIFICATIONS

Wingspan: 1500mm / 59 in

Length: 1585mm / 62.40 in

Wing Area: 1055 sq. inch



## EXTRA MX BEYOND THE MAXI

### SPECIFICATIONS

Wingspan: 1,472mm / 58 in

Length: 1316.5mm / 51.83 in

Wing area: 721 sq inch



### SPECIFICATIONS

Wingspan: 1448mm / 57in

Length: 1431mm / 56.34in

Wing Area: 749 sq.inch



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# SILENT SCALE

*Chris Williams offers up a batch of handy hints that will not only be appreciated by scale gliding fans, but for general modelling too*



*Author with the newly completed Bergfalke IV*



*Posing with added winglets*



### Clunk Click

**T**o those with only one or two scale gliders in their fleet the following may not be much of a problem. But if you have so many that you run out of fingers trying to count them the business of populating the office can be a head-scratcher, especially for those suffering from a constriction of the wallet. The trouble is, no matter how nicely you build your scale model it is the pilot that adds the final touch. So it's worth, when possible, investing in the Little Folk when you can. My current project is a good case in point.

You may remember me describing the Bergfalke IV last time around. Well, once she was completed I was left with a large canopy covering an even larger looking space inside. Lately, I have been engaging the services of Tailored Pilots, and it was with them in mind that I bit the bullet, sedated the Bank Manager, and ordered up a couple of civvy pilots to fill the space. These figures are very nicely detailed, and not exactly cheap. But in this case you get what you pay for. At these prices, however, it's not really feasible to have a pilot of this calibre in every model, especially when the fleet numbers around seventeen at the last census. So a way must be found to enable them to be deftly moved from one airframe to another without the use of an anaesthetic.

One of the more odious tasks of fitting a pilot into position lies in the sourcing of the material to make up the restraining straps. Up until now I have resorted to using old brassiere straps, but you never heard this from me, right? Fortunately, Tailored Pilots come with straps already pinned to the body, and thus did I come up with a bright idea. Why not use that brilliant invention, Velcro, to hold them in place, thus making ingress and egress a quick and painless procedure? Anyone who has ever used the stuff will know there is one big drawback... The Velcro is three times stronger than the sticky stuff on the back, and when it comes to ripping it apart it usually stays stuck together and the sticky stuff gives up without much of a fight instead!

What seems to work in this case is this: One Velcro patch is pinned to the pilot's back inside the webbing. The pins are angled sharply to resist the pull of removing the pilot. In the cockpit the other half of the Velcro is stuck to a suitable part of the structure, preferably with a ninety degree bend somewhere, which greatly enhances the chances of it staying there (one solution is to use a piece of transverse dowel with the Velcro wrapped around it). As I hope you will agree, the pilot figures really look the part in the new Bergfalke. And as they are now easily removable, I can take them out every night and put them in the safe...

If you fancy one for yourself, go to: [www.ytinternational.co.uk](http://www.ytinternational.co.uk)

### Card Tricks

I have an arrangement going with my pals Motley and Smallpiece whereby when the hangar gets jammed-packed with models, and there's no room for any more, I pass on the older ones to one or the other of them.



*The two new pilots fixed in place*



*A Velcro pad is bent over 90 degrees to aid adhesion*



*The other Velcro pad is pinned the back of the pilot figure*

The advantage of this is that I still get to see them fly on a regular basis, and I don't have to carry or rig the darn things. Smallpiece is the problem, though, because due to the enormous weight of his wallet, he sometimes becomes distracted when he thinks he's dropped it. And if he's flying at the time the result is that yours truly ends up with the repairs. This was the case when he flew the Minimoo along the ground inverted and wiped out the very complicated canopy. (It could have been worse, he could have hit the wallet).

Having re-built all canopy framework, and thinking that the worst was over, I found myself faced with the task of fitting the glazing. This is where good old thin card comes in to play. It would be a difficult task indeed to lay a sheet of PETG over the framework and cut it to size, which is where templates are so indispensable.



*Thin card template made up for lower fuselage sheeting*





**Above & below:** Complex curves are easier with two templates taped together



A pack of printable A4 thin card costs very little from your local office supply shop, and my last purchase is still going strong after three or four years.

So here are the tricks... First, cut the template oversize and then lay it over the area that you want to cover. Now, if you press firmly along the edges of the area the imprint will show itself on the card in the form of creases. Holding the card up to the light will throw these creases into shadow, allowing you to cut along them with scissors to the correct shape. A little more trimming might be required but you might be surprised how accurate this procedure is, even at the first attempt.

When it comes to a shape like the front of the hinged part of the canopy the final template will have a very deep curve to it and it might be a difficult task to do it in one go. The answer is to split the job in half and do one side at a time, simply taping the two halves of the template together. This allows you much more room for small adjustments, which with one piece might

well result in you have to do it all again. This applies for many cockpit hatches, including making templates for the ply sheeting. For the rear turtle decking or lower keel area on a model simply tape one or more pieces of card together, lay over the rear sheeting and press against the top longerons to force their imprint into the card.

And for my next trick...

### Project Conclusion

As you may have gathered from the foregoing, the Bergfalke IV is finally finished. Built to one quarter scale, she is intended for slope use in light conditions, just like her predecessor, the Bergfalke 1. To this end the flying surfaces have been covered in Profilm to keep the weight

down and she has finished up with an AUW of around 13 lb. (Still an approximate weight until flight tests have established the optimum C of G). This is a relatively light weight for the size of model, although I could never lay claim to being a light builder. This is because I have little respect for 'soft', or even 'medium' balsa wood, preferring the hard stuff through which my fingers will not pierce when lifting the model off the ground.

The model is of fairly conventional wood and fabric construction, with the fuselage being covered in Solartex. I prefer fabric for the complicated contours of a fuselage. But with an open structure all the way to the nose this means that the fabric comes to an end on the sharp compound curvature of the nose cone. Rather than try to iron it right up to the tow release, I prefer to cut it short and to lose the edges by brushing 2-pack primer over the nose area, before rubbing it down preparatory to spraying the fuselage. It is perfectly possible to brush primer on to a solid surface, as in this instance, although the gains of not having to set up for spraying are offset by the tedium of flattening out the brush marks afterwards! (Also, flattening an open fabric area is fraught with difficulty, not the least of which is rubbing through the material where there is a former, longeron or rib underneath.)

At the time of writing the Bergfalke is maiden ready but the weather is, as usual, in an uncooperative mood. Assuming all goes well the plan will be published in due course...



**The Scheibe Bergfalke IV. Wingspan is 4.4 m, at 5.8 kg AUW**





*We maiden the second of the Bergfalke IV's at the White Sheet event in early March. This one belongs to my pal Motley*

### Getting The Right Balance

Although the following was covered in Quiet & Electric Flight International last year, there's no reason why readers of this mag couldn't have the same subject brought to their attention; that is, the business of determining the Centre of Gravity of a new model. I have found over the years that as my gliders got bigger and heavier, trying to balance them on my thumbs under the wings to see where the point of balance was located, was getting to be more and more difficult. Regardless of the strain on the opposable digits, how do you mark the appropriate place whilst your hands are fully occupied?

To overcome this recurring problem I set to and designed a C of G rigging stand to take

out all the guesswork. The general theme is this:

You place your model on the stand roughly where the C of G ought to be. It will either rock backwards or forwards depending on where the current balance point is and come gently to rest on the arm extensions. Sometimes the C of G on a kit is measured in millimetres from the LE, the same usually applies to a plan. The forward arms of the stand are extended in order to protrude out from under the wing LE and here's the neat bit. A printed ruler is glued to the arm each side, with zero being at the point of balance. All you have to do is check that the model is square to the stand by evening up the numbers, and you can read the balance point from the LE simply



*Author's bespoke Centre of Gravity stand*





Two seater Minimoa getting its C of G evaluated



Single seater Minimoa set up with both stands for decalage measurement

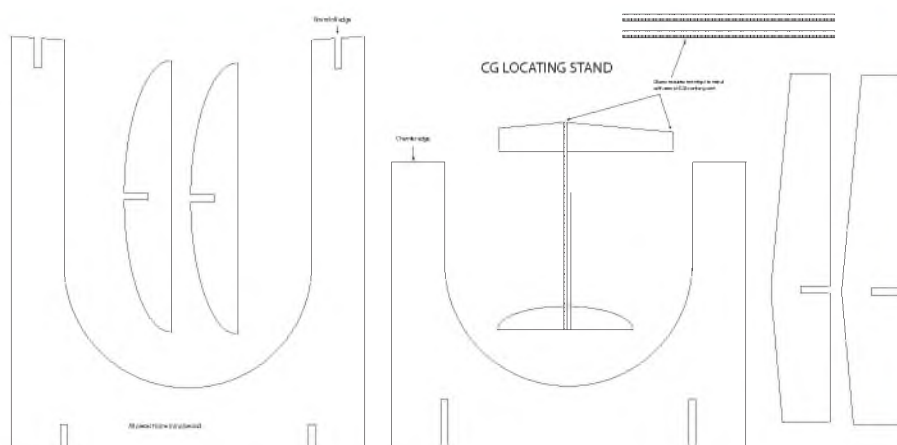


Printed scale allows easy measurement of C of G to the LE

by looking down and noting the result. It's best this task is carried out in relatively calm conditions if you are doing this outside.

It gets better: if you want to check the decalage, you just move the model backward and set up an additional stand at the rear of the fuselage; a stand that is adjustable for height. You can then set the tailplane to zero, making the job of reading off the angle of attack of the wings that much easier.

Both stands are made up from standard 6 mm ply, so it won't break the bank to make them. Better still, should you want one or both of them for yourself, you can email for the FOC drawing. This is in PDF format and A3 size, and also contains the printed rulers. **RCMW**



C of G stand drawing. See page 94 for larger version

## CONTACTS

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For club flying there's a lot to be said for using a simple 6-channel radio. Let's take a look at Hobbico's take on a set aimed at intermediate sport modellers

# TACTIC TTX650



Tactic range of sport radios. The Tactic brand is likely to become increasingly familiar as the giant US model distributor, Hobbico ramp up their presence in the European model market. A glimpse at their huge stand at the Nuremberg Toy Fair shows a broad and exciting range of R/C kits and related products.

## Hit For Six?

For most sport models you are likely to want three or four channels for the main flight controls and maybe a fifth channel for operating a set of retracts. And lots of scale models these days, especially the foam types, will also feature flaps, so let's add another channel for good measure.

OK, we've got the main controls covered, but what functions do we really need? Servo reversing, sub-trim and travel adjustments on all channels are pretty mandatory, as are dual rates and exponential settings on the ailerons, elevator and rudder. Talking of trims, they should be of the digital variety, with slow and fast adjustments so if a new model is way out of trim you can get it on the straight and level really quickly and then finely tune it as required.

Mixing channels together is a bit of a dark art for a lot of model pilots but it can be really handy for dialling out adverse effects when flying higher performance sport aerobatic models. If you are lucky the radio manufacturer will have provided some

These days we have become used to seeing advanced level radio sets being used at model club flying fields all over the UK. And chances are that many of you will have one. But it begs the question of exactly how many of those hi-tech functions do you actually need to fly most sport models?

With this in mind we thought it would be a good idea to trim things back a bit and take a look at some radios that offer all the benefits of modern 2.4 GHz technology but that are not festooned with extras that most of us will rarely use.

First up for examination is the TTX650, which sits in the middle of the growing



This Chinese made radio is protected by 'egg box' type packaging



pre-programmed mixes to cover the more popular combinations (eight should be plenty). But it is also nice to be able to do your own thing sometimes, so let's add four programmable mixes to our wish list.

A recent trend is the provision of user assignable switches so that you can operate extra controls using the fingers that best suit you rather than using those that the manufacturer dictates. This is very useful if you are upgrading from an older radio and have chosen a different brand, as you can assign the switches to perform the same functions that you are used to.

When starting to set up a model you'll want an easy to read screen with simple buttons alongside to make your selections from some straightforward menus. And the screen should be reasonably sized and with adjustable contrast so that you can vary it depending on light conditions.

How many models do you own, or are likely to want to fly with each transmitter? Twenty should be more than enough, and six characters should enable you to give each one a unique name.

Another 'must have' is a count down timer so that you can time your flights and ensure that you land with enough fuel in the tank for one or two go-arounds, or sufficient capacity in a LiPo powered electric model to make sure that you don't over-discharge the pack to the point of degrading its future performance.

And if flying an electric glider wouldn't it be great if you could use the throttle stick to activate the timer so that it only counts down when the throttle is applied? Long gone are the days when we needed to stick a peg on the back of a kitchen timer, which we then clipped on to the aerial or the Tx's handgrip!

Following the introduction of small, relatively low cost helicopters the attitude to rotary models by die-hard fixed wing pilots has softened considerably. This is because many have now experienced the thrills (and the frustrations!) of rotary wing flight for themselves, often when flying small models at club indoor meetings.

So the option of selecting a set of helicopter settings would also be great. And when setting up helicopters some curves would be nice, especially throttle and pitch curves. Let's have six points so we can set up the curves quite precisely. And while we are in helicopter mode, we will want a Throttle Hold function, as well as the ability to set up the common types of swashplates (1 servo, 2 servo 180°, 3 servo 120° and 3 servo 140° types will do nicely).

With sophisticated modern radios we have come to expect a high level of safety features. The main one is, of course, failsafe and most pilots will set this to cut the throttle and hold the other channels in the last position before the radio signal was interrupted. Another useful safety measure is a low voltage alarm to warn you when it is time to change the batteries inside the Tx or to recharge them if using a rechargeable pack. And to cap it off, how about a throttle stick warning that, upon switch on, warns you that the throttle stick is high and needs to be reduced before starting the model?



*TR624 receiver supplied is said to be full-range but we are going to continue using ours for small models and will fit a dual aerial TR625 when using the transmitter to fly larger aircraft*



*The manual is well written and features lots of useful screenshots*



*A set of AA alkaline cells is provided to fit straight into the battery box, although it is good to have the option to fit rechargeable cells too*

Since a lot of six-channel radios are purchased by newcomers to the hobby it makes sense to be sure that they have a trainer facility, whereby the flight instructor and the student pilot each hold separate transmitters. In the past the two transmitters were linked with a physical cable, which could easily become disconnected.

So let's use that modern tech to our advantage and provide a wireless trainer link so that there's no danger of the link between the instructor and the student from being severed. It's also more comfortable to not have to cuddle up side by side! The only downside of this is that the two transmitters will need to be of compatible wireless types.

Wow! Even though we've covered just the basics needed for sport flying, that's still quite a list. Fortunately the Tactic TTX650 has got all the above covered, plus a lot more besides.

## Secure Link Technology

Tactic/Hobbico call their 2.4 GHz radio protocol Secure Link Technology, or SLT for short. SLT is an FHSS spread spectrum frequency hopping system, which changes frequency hundreds of times each second and so maintains a good radio link. In addition the transmitter broadcasts a uniquely coded signal that the receiver locks onto, and once this link has been established the receiver will not respond to any other signal except the one from the matching transmitter.

Besides offering a solid radio link, SLT offers the ability to link the transmitter to Hobbico's growing range of Transmitter-Ready (Tx-R) aircraft. These are pre-built and ready to fly models that are available as part of the company's Flyzone, Heli-Max and Great Planes ranges. Tx-R models have all the radio equipment installed, including an SLT receiver, so all you need to do to pair them to the Tactic TTX650 transmitter is to push the link button on the receiver.

## Boxed Set

The TTX650 comes complete with a TR624 six channel SLT receiver and is neatly presented in a nearly square format colour box. The transmitter and receiver are protected in transit by the now ubiquitous 'egg box' type inner packaging. This works well and is arguably more environmentally friendly than the polystyrene trays which used to be so popular.

A set of four 1.5 V AA alkaline cells are provided to power the transmitter and these are quickly inserted into a battery box that resides under a cover at the rear of the Tx. We like the fact that Tactic also list the use of 1.2V AA NiCad or NiMH rechargeable cells, as many users will have these readily available at home, most likely of the NiMH type.

The Tx can also be powered by a 4.8 V rechargeable flat pack, which can be charged via a socket on the left hand side of the case. The charging jack is configured with the centre pin as positive and so is compatible with Futaba style chargers and charge leads. Just above the charging jack is another socket, which is where an optional USB Firmware Interface can be plugged in to download free firmware updates from the [tacticrc.com](http://tacticrc.com) website.

Finally, a 48-page black and white manual is provided, which guides you through the set up of the radio using lots of clear screenshots and concise descriptions.

## In The Hands

Thanks to its compact size and curved sides the TTX650 sits nicely in the hands and all the switches are easy to reach. The sticks are smooth in operation thanks to quad-bearing gimbals, but out of the box the stick tensions are quite firm and the throttle ratchet has quite a notchy feel. However, both tension and ratchet firmness are easily adjusted by removing the back of the case and tweaking the small adjustment screws alongside each gimbal. Stick lengths are also adjustable to suit personal preference. The set is supplied as Mode 2 but can easily be changed to Mode 1 if desired.



The top mounted antenna is articulated and should be angled so that it does not point directly at the model in flight.

### Assignable Switches

This Tactic transmitter has seven switches, all of which are assignable. They are situated in two groups on both shoulders of the Tx and take the form of either long or short, 2 or 3-position switches. There is also one 2-position, momentary action switch that is set to operate the Trainer function by default in Airplane (sic) mode, or as Throttle Cut in Helicopter mode.

Programming of the radio is via push buttons on either side of the screen. On the left are:

Servo – pressing this brings up the servo monitor screen, so that you can instantly assess any changes made to settings and mixes across all six channels.

Clear – used to return values to factory defaults.

ESC – use this to escape back to the previous screen and remove pop-up messages.

On the right are:

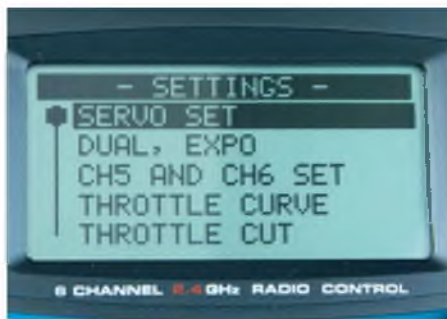
Up Arrow and Plus – annotated with symbols rather than words, this button moves the cursor up on the screen and is also used for increasing highlighted values and settings.

Down Arrow and Minus – as above but in the opposite directions.

Enter – used to select or deselect a setting or to enter a screen. If pressed briefly it brings up the Settings menu, or if pressed and held it brings up the Model Select menu, thus giving a quick way to access the settings that are most used when setting up a model or changing parameters.

### Screens And Menus

When first switched on and in normal use the LCD displays the 'home screen'. This shows the model memory name and number, the battery voltage, model type and the timer. The latter can be set to count down or up, although the down is



The top half of the Settings menu

the norm for timing fuel or battery runs. The ability to start or stop the timer via a variable trip point of the throttle is highly valued.

The home screen also displays the position of the digital trims of the main controls, as well as indicating whether the RF output is on or off. Normally this is left on but it is handy to be able to turn it off when making lengthy changes to the programming of a model as it conserves battery power.

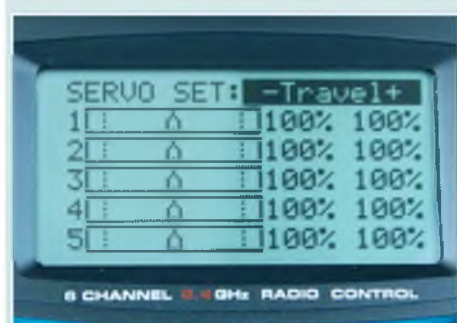
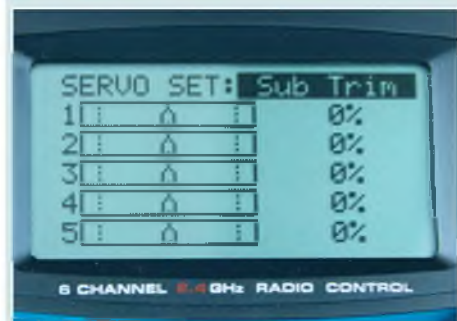
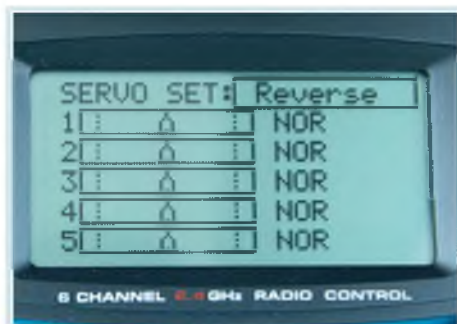
The TTX650 has three types of menus:

System Setup – Accessed whilst holding Enter and switching the set on. By using this menu you can personalise the Tx with a name, change the stick mode, adjust the contrast of the screen and the volume of the beeps emitted when you press a button or change trims etc. But it does not allow you to alter the volume of the various alarms, probably for safety reasons.

This menu also allows you to change the low battery alarm voltage, which needs to be set higher if using a set of rechargeable cells.

Model Select – This menu is used to select and manage the model memories. You also use it to define the wing/flap and tail type or, if setting up a heli, the swash type.

Next on the list is Channel Assignments, which is another relatively new feature in modern radios that allows you to reassign the channels to operate different controls so that they match channel listings that



Servo Set is where you will find the Reverse, Sub Trim and Travel Adjust settings

you may be more familiar with. The default list, in numerical order, is: Aileron, Elevator, Throttle, Rudder, Aux 1 and Aux 2. But if you are more used to, say, Throttle, Aileron, Elevator, Rudder etc. then this enables you to use the Tactic radio in a much more familiar way.

In the Warnings menu you can inhibit the throttle position, throttle cut and throttle hold warnings, although for safety reasons they are best left switched on.

Trainer set up is next and is where you can allocate which channels are enabled on the slave transmitter, ready for when using the wireless trainer link.

Finally, Trim Setting allows you to fine-tune the amount that each servo will rotate by whenever you press a digital trim.

Settings – First up in this menu is Servo Set, which is where you will find the Reverse, Sub Trim and Travel Adjustments. Next is Dual/Expo, which is where you can set up your rates, with a neat graph alongside to show you the effects of any adjustments.

The mysteriously named 'CH5 And CH6 Set' is next in line, but really it just does what it says on the tin, i.e. this is where you define which switch operates channels five and six, and also their travel limits.

Throttle Curves are usually associated with helicopters but they are becoming increasingly popular with fixed wing pilots too. Likewise, heli pilots have long benefited from throttle hold switches,



The simple but easy to understand home screen. Programming is via the push-buttons alongside



which are commonly used to disable the throttle stick while the model is being carried to or from the pit area (as well as being switched in flight for practicing autorotations).

But wouldn't it be great to have this facility for fixed wing models to stop an inadvertent nudge of the throttle stick from suddenly spinning up the propeller? Now you can, by using the Throttle Cut function to assign a switch and to set a value, which either fully cuts a glow/petrol engine or electric motor, or reduces the power to a low level, usually idle.

Aileron Differential is another function that is self explanatory, before we come to the various Mixer options. These include popular aileron, rudder and flap mixes. If you have selected either a one aileron servo or a two aileron servo wing, plus flaps, then you will be given an additional option called Air Brake Set, which can be utilised to set up different types of air brakes, the most popular of which is probably crow braking for gliders.

Next on the Settings list is Programmable Mixer, which allows you to set up to four programmable mixes of your own choice. However, you are likely to find that the pre-programmed mixes are suitable for most applications.

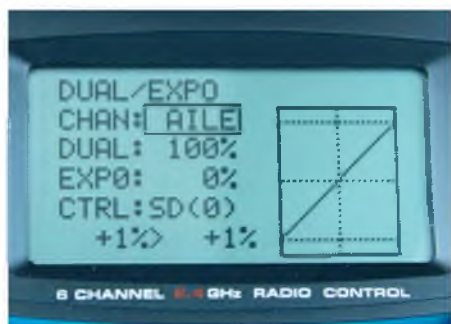
Finally, we come to the RF Output and Timer functions, which have already been discussed.

## Receiver

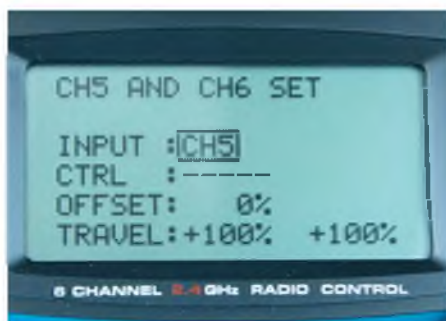
The Tactic TTX650 is supplied with a TR624 receiver. This 6-channel unit is listed on the Tactic website as: "A full-range flight receiver with a 1.2" (30 mm) antenna, for optimum reception in everything from electric park fliers to large, glow-powered models."

Now 30 mm doesn't sound a lot and you would be right, as there is hardly any aerial sticking out of this receiver. Mind you such a short aerial makes for an easy installation and there is much less risk of the wire becoming damaged.

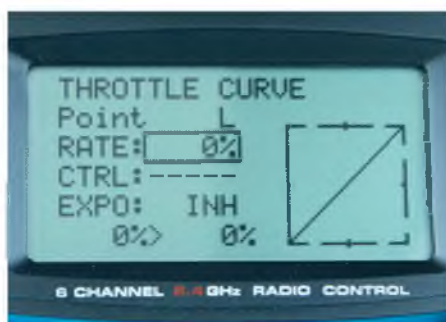
But as so many modellers have become used to the reassuring sight of at least two Rx aerials, often fairly long in length (or, if short, backed up by a satellite receiver or two) then we cannot help but feel that Tactic might have scored a bit of an own goal by not offering this very capable set with the more traditional looking Tactic TR625 2.4 GHz Six Channel Twin Antenna Receiver. As the name suggests, this alternative SLT receiver boasts a pair of 5.9" (15 cm) coaxial aerials.



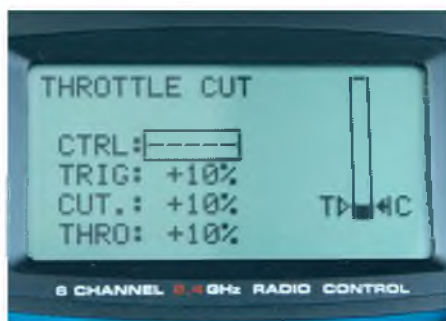
When setting up Dual Rates and Exponential it is good to have a graph to refer to



The not so mysterious 'CH5 AND CH6 SET' is where you can assign switches for the last two channels



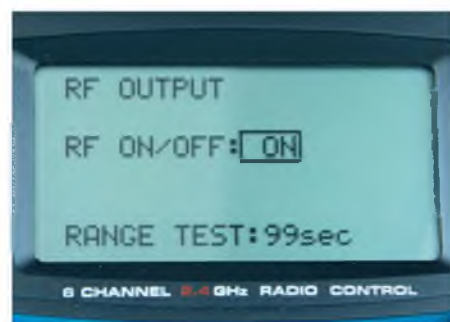
Throttle curves are not just for helicopters! The six point curve is shown in linear mode before making any inputs



Throttle Cut screen ready to assign a switch and to set up the trigger point



Lower half of the Settings menu, showing the Mixer options and the location of the Timer functions



RF Output can be turned off to conserve the battery when setting up a new model or trying out different mixing options



Press the Servo button (circled) at any time and a useful servo monitor is displayed



If you leave the set switched on and unattended for a few minutes it will assume that you have forgotten to switch it off and will sound an alarm before automatically shutting down





*The two banks of shoulder-mounted switches are fully assignable*

However, this optional receiver is slightly more expensive than the TR624 and since this sector of the market is so price sensitive we can perhaps understand Hobbico's decision to want to make this Tx/Rx combo as affordable as possible.

#### It's A Wrap!

Summing up, we have to say that we have been quite impressed with the ease of set up of the Tactic TTX650. And whilst obviously being aimed at the more cost conscious end of the market we have to say that we are very impressed with what around £110 will bring you in terms of useful functions. Indeed, this very capable transmitter includes some fairly new features, such as switch assignability, channel assignability and a throttle operated timer, which are missing from some quite advanced mid-range transmitters that we regularly use and which are just a few years old.

Combine this with the ability to link instantly to Hobbico's growing range of Tx-R transmitter ready models and the TTX650 is truly a bit of a bargain. **RCMW**

## MODEL WORLD DETAILS

### MODEL INFORMATION

<b>NAME:</b>	Tactic TTX650
<b>MANUFACTURER:</b>	Tactic RC
<b>DISTRIBUTOR:</b>	Hobbico in the UK
<b>WEBSITE:</b>	<a href="http://www.tacticrc.com/transmitters/tacj2650-ttx650/index.html">http://www.tacticrc.com/transmitters/tacj2650-ttx650/index.html</a>
<b>PRICE:</b>	£113.99 SRP
<b>PRODUCT TYPE:</b>	6-channel 2.4 GHz spread spectrum radio system
<b>PARTS SUPPLIED:</b>	6-channel transmitter, TR624 receiver, 4 off AA alkaline pencils, ratchet bar
<b>PARTS REQUIRED:</b>	Servos

### DISLIKES

Would have greater appeal if packaged with the TR625 Twin Antenna receiver

### LIKES

Provides a lot more functions than we would expect for the price • Includes some of the very latest functions • Ready to use with any Tx-R aircraft

*We were very impressed at the functions packed into this keenly priced radio control set*





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# CAPICHE 52

*This 1.5 metre span sports aerobatic model from Weston UK is not only aimed at experienced aerobatic pilots but can also be enjoyed as a first low wing model with the rates lowered. Neville Hill puts the quick build kit together*



I had been waiting for an aerobatic plane such as this to review so I was quite excited to have an offer of the Weston Capiche 52. It ticks all the boxes for me – it looks good, is ARTF for a quick build, and is fully aerobatic and will do 3-D (although I'm not the most enthusiastic exponent). It was supplied to me with almost all the parts needed to complete and fly.

So what do we get in the kit? It is supplied in a large cardboard box showing the finished item, and giving the model's specification and what is needed to complete it to a finished flying state.

As you would expect the fuselage, wings and tail group are all nicely packed and individually wrapped in poly bags. In addition they are taped to the box to eliminate any movement during transit. Also packed in a smaller box were both mains and tail wheels, a spinner, fuel tank, hinges and horns, screws and bolts, and closed loop wires and adjusters, along with all the glues required. I'm not certain if the glue normally comes with the kit, but all together it's a fairly comprehensive list of parts. Again all items were individually wrapped in poly bags.



*Our sample kit came with this nice spread of optional parts, including a Hitec Aurora 9X radio, a West Eurotech 53T1 glow engine and a matching Genesis pipe*





Amongst all this are the bits to enable the aircraft to be fitted out for I/C or electric power. The build instructions looked to be a bit slim on detail but this plane is obviously not for a beginner so some expertise must be assumed.

Unwrapping the main parts it soon became obvious that the covering iron was

going to get some use. The covering was not taut in quite a few places, but this was not a problem and most ARTF's suffer to some degree with this.

The fuselage was very light, as most ARTF's are these days. And on checking the glue joints all looked to be satisfactory, with no extra gluing required.

The ailerons, rudder and elevators were all hinged and just needed to have some thin cyano wicked in to fix them in position.

All of the screws horns etc. looked to be quite satisfactory and they would give me no problems with their use. The exception was the clevises for the elevator and rudder closed loop systems, which were of a plastic type. My personal choice for these would have been metal ones. I did use fuel tube keepers on them but I still felt a trifle uneasy as the wires need to be very taut to stop flutter. But only time will tell.

Weston UK had been very generous and in addition to the plane they also supplied a full Hitec 9-channel Aurora radio, along with a receiver and high spec digital servos. They also supplied the recommended West Eurotec 53 T1 two stroke glow engine, complete with a Genesis exhaust.

### Wings And Ailerons

First thing is to check that all the Mylar hinges are in the correct position and to glue them with thin cyano, whilst ensuring full and free movement. You need to fit the control horns in the correct position relative to the servo output arms (I had to trim the hinged edge to allow the aileron to fully close onto the wing, thus giving full movement). Next, I fitted the Hitec servos and made pushrods from threaded rods provided. The kit comes with swing keepers but I put 'Z' bends on the rods in preference and coupled them up less the keepers.

I needed two short servo extension leads to reach through the fuselage sides when the wing panels were attached.

### Tail Group

Trial fit the rudder (with the tail wheel in position) and elevator, and ensure these are positioned correctly to the fuselage centre line, both vertically and horizontally. Mark the positions where the film is to be removed.

To remove any film covering the gluing area I use an old soldering iron, run up against a metal ruler and apply just enough pressure to cut through the covering. The unwanted film can then be removed without marking the balsa or forming a stress raising cut underneath, as sometimes can be caused with a sharp scalpel.



One stop shop! Weston UK can supply their kits with a full suite of matching radio and engine parts



Kit components after removing the airframe parts from their poly bags



Reposition and glue it all together, following the correct sequence as detailed in the instructions. Finish by ensuring that you have full and free movement.

### Closed Loops

The interesting part to me is fitting the closed loop system. First, I fitted the Hitec servos in the cut outs in the fuselage. You then need to pull the rudder and elevator wires through the pre-fitted tubes in the fuselage and position them so that there is sufficient length at each end to work on. Sight along the tail end wires to position the rudder and elevator control horns so that there are minimal bends in the wire. Screw a clevis onto each adjuster and couple them up to the control horns.

Thread one of the crimps on the wire, pull the wire through the adjuster and thread it back through the crimp. As a safety measure pull the wire through the crimp a second time, forming a tight loop, and crimp with pliers. Repeat with all six wires, two on the rudder and four on the elevator.

Now, let's start on the servo ends. Use the longest dual servo arms you have, attach them to the servos. Pull a crimp through the wire but try not to let it run down into the fuselage (it always does) and pull the wires through the outer arm holes nice and tight. Bend it back on itself; this will put a slight kink in the wire and then thread it back through the crimp twice (my safety measure again) and crimp tight. Job done! (You may need to take the arm off the servo to get the pliers around the crimp, but make sure that it all stays in the correct position as you do this.)

The instructions remind you that one wire goes to the top of each elevator and to one side of the servo, and one goes to the bottoms, with both going to the other servo side. Easy!

Tighten up all the tail end adjusters and make sure you put a fuel tube 'keeper' over the plastic clevis as a safety measure to stop them popping off.

A nice touch at all the servo positions was the pre-drilled holes for the servo screws.

### Undercarriage

I was unable to find any tail wheel fixings in the kit so I just used a couple of wheel collets of the correct size from my 'box of bits'.

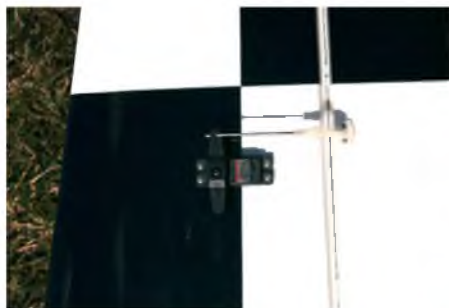
The instructions for fitting the main wheels and spats did not seem to match the parts supplied so I used a bit of common sense when fitting them. I had to add a few washers between the wheels and spats, and I also needed to fettle the spat edges to allow the wheels to turn.

The aluminium undercarriage was then screwed in place using the cap bolts supplied, screwing them into the pre-fitted 'T' nuts in the bottom of the fuselage.

### Engine

Before proceeding with fitting out, I fuel proofed the whole of the motor box and firewall, and back into the fuselage as far as practical.

Fitting the two-part engine mount needed just a shave of the corners taking



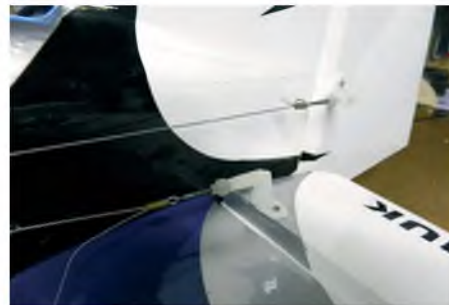
*Aileron linkages are commendably short and stout*



*A short extension lead is needed on the Hitec wing servos to allow them to reach the receiver. Neville favours lead locks to make sure that the plugs stay connected*



*The wires should be looped back through the crimps as a safety measure*



*Nearly finished! Just one wire to crop and the job's done. The closed loop tubes are pre-installed, which makes for an easy installation*



*Tandem closed loop elevator and rudder servos*



*Large bulldog clips were used to keep the elevator at neutral whilst crimping the closed loop wires*

off to allow them to fit into the recessed firewall. They were then bolted on with cap screws to the pre-fitted 'T' nuts.

The engine fitted perfectly and I only had to set the distance from the firewall to mate it up with the front of the cowl. Four deep core self tappers were supplied to hold the engine in position but I chose to use my usual method of cap head machine screws and Nylock nuts as I feel happier with this.

I mounted the throttle servo to the underside of the firewall box, which gave a direct pushrod route straight to the throttle

lever. (There are cut-outs for the servo but the pushrod route using these is not so direct.)

The rather special exhaust proved to be a doddle to fit. And using long cap head screws through the holes on each side of the exhaust port of the engine it was soon tightened up. Instead of using a gasket between the mating surfaces, Weston recommend using a smear of 5-minute epoxy to firmly fix the Genesis exhaust in place.

I then fitted the fuel tank, which was fixed in position with the hook and loop



supplied, and piped it up using feed, fill and pressure lines. I also glued in a length of 6 mm balsa at the back to stop it moving rearwards.

### Cowling

I marked the position of the exhaust pipe and cut out the cowling to suit. This was made easier by drilling a series of small holes and cutting it out with my mini drill fitted with a small Permagrafit rotary burr.

The cowling is fixed to the fuselage by machine screws into pre fitted 'T' nuts. Once positioned I was able to see where to cut the hole for the cylinder head and glow clip access. One further small hole was needed for needle valve adjustment, as this is done using a small screwdriver and not via a wire extension.

### Canopy

When using the supplied canopy glue it may have been better had I roughed up the contacting surfaces, as the canopy peeled off when the glue had set. I decided to fix the canopy in position with small screws. The fit was reasonable and it looked good when fitted.

### Radio

I was not familiar with the supplied Hitec Aurora 9X radio. So after I had fixed everything in position and coupled up the receiver, I started to play. Binding was different to my Futaba set but on reading the instructions it was soon completed. The manual is well set out and I didn't have too much bother in following it. Being able to set up two servos for aileron use was easy. And reading how to set rates and exponential on this set was quite easy to understand.

### Finishing Off

As is my usual practice with I/C power models, I treated all the edges of the covering and trim with a coat of Clearcoat to fuel proof them.

Finally, I checked and set the Centre of Gravity (C of G). I found this to be a tad tail heavy and I needed to add 60 grams to the firewall. I also added 10 grams to the right wingtip to balance the plane width wise. After rechecking the radio functions and throws, my last job was to range check the radio system.

All that's left now is to run the engine up and test fly the Capiche 52.



*Barn door size control surfaces promise agile 3-D performance. Or cut down the throws and enjoy some smooth aerobatics*



*The removable top hatch allows easy access to the fuel tank/radio bay. Or fit a 5S LiPo and a 590 KV brushless motor for some potent electric action*



*The large cowling neatly encapsulates the West Eurotech 52T1 two stroke and Genesis Mini pipe*



### General Comments

This plane is not for a novice, as a fair degree of competence is required before attempting to fly her.

The cap screws seemed to be a bit of a mismatch. Some were unified course series (UNC) 4-40. These are an American thread form but neither Imperial nor metric Allen keys will fit these. Others did seem to be metric but I must admit eventually I was very confused as to what fitted what.

### RCMW

### Next Time

*A combination of windy weather and the recent move of the Traplet offices has conspired against us for the test flying of this rather capable looking aerobat. But now that everything has started to settle down, both internally and weather wise, I hope to be able to accompany Neville to the flying field to help him test fly the Capiche 52. Provided that all goes to plan, we will have an extensive test flying and engine report in the June issue of RC Model World – KC*

## MODEL WORLD DETAILS

### MODEL INFORMATION

<b>Name:</b>	Capiche 52
<b>Supplier:</b>	Weston UK
<b>Website:</b>	westonuk.co.uk/westonuk2_248.htm
<b>Model Type:</b>	High performance for freestyle aerobatics and 3-D
<b>Price:</b>	£239.99 – Kit only £409.99 - With West 52 engine & pipe
<b>Engine Recommended:</b>	West Eurotech 53TI and Genesis pipe
<b>Engine Used:</b>	West Eurotech 53TI and Genesis pipe
<b>Radio Required:</b>	5 channel minimum
<b>Radio Used:</b>	Hitec Aurora 9 X
<b>Servos:</b>	Hitec HS5625MG & HS311 (throttle only)
<b>Construction:</b>	Built up balsa and ply
<b>Parts Supplied:</b>	Airframe, hardware and accessories, Hitec Aurora and servos (not supplied with the kit), plus optional West Eurotech 53TI and Genesis pipe
<b>Parts Required:</b>	None for this review – Weston UK had thought of almost everything!

### MODEL SPECIFICATIONS

**Wingspan:** 1575 mm  
**Length:** 1650 mm  
**Flying Weight:** 2.8 kg

### R/C FUNCTIONS

1: Aileron                      3: Throttle  
 2: Elevator                    4: Rudder

### LIKES

- Very little work required too finish
- Well built • It's a very nice looking aircraft • Comprehensive list of parts supplied in the kit

### DISLIKES

- Not having Allen keys readily available to fit the screws supplied • Canopy glue did not key to the covering



Capiche 52 has a two piece wing for easy transportation



 <b>CAPICHE 50CC</b> £510.60	 <b>OBESSION</b> £245.10	 <b>MINI HYPE 3D</b> £134.78	 <b>HYPE 3D</b> £194.99	 <b>CAPICHE 52</b> £239.99
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	<b>50CC £91.88</b>	



*We've all got to start somewhere when learning new things in this amazing hobby. And that's particularly true when building our first true scale model. Chris Freeman relates how his son, Byron, suffered a series of knock-backs after building his first scale motor glider*



# FOURNIER FORTITUDE



*Byron's first Fournier is almost ready for painting. It had Solartex on the wings and a glassed fuselage*

In 1987 I had an opportunity to purchase a second-hand Mick Reeves 1/4 scale Fournier at a price that my very limited budget could afford. The finish was a little rough but my intention was to strip the airframe and to recover it and paint it. When I took the airframe home and inspected it I was concerned that the wing joiner, which is a combination of ply and dowels, would not be strong enough. I decided to test fly the aircraft to see if it would be worth the time and effort to redo. Afterwards, whilst still at the flying field, I stripped off the covering, much to the amazement of those present.

The airframe was cleaned up and recovered with Solartex on the wings and

control surfaces, and tissue on the fuselage and tailplane. My father-in-law sprayed the airframe as I lived in a flat and had no access to spraying equipment.

## Engine On Loan

Whilst I was finishing the Fournier one of the people that I was teaching to fly came to visit. Colin asked why I was installing a 2-stroke engine when this airframe needed a 4-stroke? I replied that I would love to install a 4-stroke but I could not afford one.

Two days later Colin arrived at the flat and gave me a box. He asked if I would mind running in his OS 90 Surpass in the Fournier? I ran in the 90 and it stayed in the plane for years. Colin would fly the

Fournier once it was in the air but he would not take off and land the aeroplane as he was nervous of it. I eventually broke the Fournier and placed the parts in storage, as it was not that badly broken. I gave the engine back to Colin, who by now was a close friend.

Often when Colin would visit we would talk about aircraft and the Fournier would often be discussed. My son, Byron, who was by now about 12 years old, asked questions about the Fournier so I showed him the broken airframe and he asked if we could fix it? I ordered a plan, canopy and a cowl from Mick Reeves and as soon as we received them we repaired the airframe, installed the radio equipment and an ST 75 that did not have a home.

Byron soon fell in love with the graceful aerobatics and steady flying of the Fournier. Colin started to talk about me building a Fournier for him and even arrived one day with a Saito twin that he had bought for it. But plans change and time moved on, with the old Fournier being flown every now and then.

## A Fournier Of His Own

Just before Byron's 16th birthday we went flying and decided to take the Fournier with us. Byron had a couple of flights with it and all he could talk about was how well the aircraft flew and how he would love to build one. I managed to contact Mick Reeves and found out that he did semi kits that were laser cut. So I ordered two, one each for Byron and Colin.





Colin's electric Fournier (red) sits alongside Byron's first model (blue) before the test flights



Lots of detail and very nice finish for a 17 year old. This was his second Fournier



Nerves are stretched tight as the Fournier has a photo taken before the maiden flight

At the same time I found plans for a slightly larger Fournier that was designed for electric power and I decided to build one. My good mate, Allan, laser cut the parts for my plan and soon Byron and I were building the Fourniers.

On one of Colin's visits to check on the progress of the models we discussed the options for retracts. And Colin, being a master in metalwork, was tasked with the job of making them. After much designing and machining the first retract was made and fitted to Byron's airframe.

During one of the visits from Colin he announced that his Fournier would be electric, as he thought this would be a better option. I was dumbstruck as for years Colin had been less than complimentary about some of the electric aircraft that I had built. Byron was progressing well, as much of his building was done before I got home from work.

Soon it was time to build the wings and we discussed the joining methods, as my plan showed brass tube and piano wire, and Byron's plan showed the ply and

dowel method. We decided that if the old Fournier had survived all these years of abuse then using ply and dowel could not be bad. I also showed Byron how to strengthen this area with shear webs and doublers.

Soon the airframes were almost ready to cover. But I started to question the fact that we would soon have three Fournier's, which was not practical. So I decided that my airframe would be for Colin. I told him that I thought that my airframe would be a better option and he was quite happy, but he requested that his Fournier should be covered in Monokote and not fitted with a retract.

The next time Colin came for a visit he arrived with a box and asked Byron if he would not mind running in his Saito twin in his Fournier? (Sound familiar?) Byron did not take long to reply that he would be quite happy to do it!

Soon the aircraft were ready to be flown. The electric version was flown first. I test fly most of Colin's airframes without him present so that when I give it to him the

trimming and snags are all sorted out. The aircraft flew extremely well and was most impressive in the air. It had plenty of power but was also very controllable and had good endurance. No major trimming or modifications were needed.

It was then Byron's turn to test fly his Fournier. This model was very realistic, with plenty of power and the sound of the Saito twin was great. The retracts really added realism to the airframe and seemed to make it more stable in the air with noticeably less drag. Byron was justifiably proud and happy with his creation.

### Club Visit

Early one Sunday morning we went to the Barnstormers Club, as Byron wanted to show Allan how his Fournier flew. The members at the club were quite intrigued by the shape of the aircraft, with its long wings, short retract and scale finish. Byron was very pleased by the positive response from the members. So he started the engine and took off to show how well this aircraft flew.





*Our three Fourniers. The original one is on the left, Colin's electric version is on the right and Byron's blue and white aeroplane keeps station at the rear*

*Byron has learnt many lessons from building and flying the Fourniers. It was not easy for him but to his credit he did not let the crashes get him down*

Whilst doing a slow roll he had to give quite a bit of down whilst inverted to raise the nose. We heard a bang and the wing started to fold. The roll was completed and the wings seemed to settle back in position. But the aircraft was in a shallow dive and Byron was too scared to give up, so it hit the ground about 800 metres from us. But you could still hear the impact.

It was a horrible walk to collect the airframe and Byron was shattered. We got to the crash site and it did not look good. The fuselage had broken in half and the wings had been crushed in at the leading edges. I made sure that we collected all the parts before went back to the pits.

I made Byron fly my Harvard whilst I packed the pieces back into the car. On the way home an obviously upset Byron said that this airframe was beyond repair and he would build a new one. I told Byron to relax and to clean all the parts well, and to take the equipment out of the airframe.

Later that day I sat down with the pieces and started to glue the bits back together. I made doublers for the repaired areas where they needed to be strengthened. Whilst fixing the wing I found that the original joints for the wing joiner were not that good and that my suggested shear webs had not been installed.

I showed Byron the problems and we did the required fixes. After about 10 hours of work, and a little ply and balsa, we had the airframe fixed and ready to be covered. Byron could not believe how little work was needed to fix it compared to building a new one. He then covered the repaired areas and sprayed them; even I could not see where the repairs had been made!

### **Not Again!**

Exactly two weeks after the crash we were back at Barnstormers to test fly the repaired Fournier. The guys at the club

were astounded that this was the same airframe that had crashed just two weeks before. We fuelled and started the Saito and then did a range check and final check to ensure that all was well. Byron nervously advanced the throttle and took off. Quite a bit of trimming was needed so he climbed to height and I started to help with the aileron trim.

The Fournier suddenly pitched its nose down and started rolling to the left. It dived full bore into the ground quite a long way from where we were. This time you could hear that the impact was much worse than before and we were left with another long walk to find the wreck. The crash was very bad with lots of small pieces all over the place. My biggest concern was for the engine as the spinner was buried in ground that was as hard as concrete. The motor was picked up and it was clear to see that the crank was bent but it had no other visible damage. We also found that the retract unit was bent so this would have to be remade.

We packed all the pieces into the car and on the drive home I could see how upset Byron was. Two crashes in two weeks and the next day was his 17th birthday.

I remembered that we still had the part kit that I originally got for Colin, so I gave that to Byron. When we got home we checked the radio and it still worked. The battery still had plenty of charge so the crash was one of those mysteries. That very night Byron started building his new Fournier.

The next day I contacted Colin and told him about the motor and retract, and he said that he would fix them and he gave me a indication of what parts would be needed to fix the motor. I contacted Tony Stephenson at Traplet Publications and explained what happened and he immediately offered to locate the required



*Seeing a nice scale model like the Fournier in the air makes all the trials and tribulations worthwhile*

parts for the engine.

It is now nearly a year later and the new Fournier has flown and it is even better than the first one. The Saito is, if anything, even better than before and Byron is a very happy chap!

### **Lessons Learned**

What I did find through this exercise is just how much people are prepared to help their fellow modellers, and also how much this hobby can test your resolve and character. I am pleased to say that Byron passed with flying colours, as he did not allow the crashes to get him down. I also learnt that I must make sure that I check Byron's aircraft better whilst they are under construction and in flight.

The one question that I still need to find the answer for is: why is it always the nice aircraft that crash? **RCMW**



*A last look at the Freeman Fourniers*



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E&OE



# FOURNIER RF-7

Introducing a revised CAD version of Peter Miller's 1/6th scale RF-7. At 62 inch wingspan, this clipped wing motor glider suits .26 - .32 four-stroke or .15 - .20 two-stroke engines



Inspiration is a funny thing. I have had 13-views in my files for years and never felt like building a model from them, until one day the urge just strikes. Other subjects keep coming back time and again. The Fournier RF-7 is one such model.

Many years ago I designed a small model based on the Fournier range. This was called the O-Four9nier. It would thermal and yet do aerobatics on a Cox .049 Texaco. That model was so nice that I designed a scaled up version called the Falcon. This model was 73" span and it used to amaze people because it was aerobatic on an SC 10.

Recently I was looking round for inspiration and I thought of the Fournier RF-7. Now the Fournier RF-4 is well known for its aerobatic capabilities. Anyone who has seen the display put on by two of these aircraft, including very close mirror flying, will know what I mean.

The RF-7 is the only factory built one of its kind. It is basically an RF-4 but has had the wings clipped for better aerobatics. The tailplane is slightly larger and the nose is a fraction longer due to using an RF-5 engine mounting system. I am told that the aircraft is stressed to 13G

The only other RF-7 was built by an Italian gentleman, who built his from scratch using works drawings.

It just so happens that the original aircraft is based on our local strip, so I was able to measure up the differences, and work from a fairly accurate three view and these measurements.

## The Model

The model is designed to be very close to scale but making some allowances for good, safe aerobatics.

I normally start off the design by choosing a wing area for the engine that I intend to use. In this case the desired wing area was around 500 sq in. The scale wing area at 1/6th scale came out at 434 sq in. I decided to increase the tip chord from a scale 5" to 6". This increased the wing area to 465 sq in and reduced the possibility of tip stalling.

I used NACA 3312 for an aerofoil as this has a flat bottom for ease of building but a better Phillips entry, which improves the inverted performance. I set the wing at 0° true incidence as this makes the wing work just like a symmetrical section.

Power chosen was one of my trusty SC 30 FS engines, which I knew would provide the perfect power for this size of model.

There is no detail on the model in the interests of weight saving. You can add exhaust stacks, wing root fairings and other external detail if you want to, but try not to add any significant weight. The final weight came out at 3 lb 12 ounces, which gave me a wing loading of 18.58 ounces per sq ft. Just the sort of figure that I wanted.



The original aircraft is based on our local strip, so I was able to measure it up and work from a fairly accurate three view





Basic fuselage frame. Make sure that it is square



Underside view of fuselage with 1/4" sheet treblers fitted

### Flying

This is the part that everyone wants to know about before they decide whether or not to build the model.

First flights were made from our old WWII runway on a perfect Sunday afternoon.

The take off was smooth and straight, but the model needed some up elevator to get it to unstick. I suspect that this was due to the fairly level ground angle.

Once in the air I had to apply a little right trim and a touch of elevator trim, and she was flying straight and level.

I first tested out the stall. Low throttle, feed in up elevator and she started a slow descent with a very leisurely wing drop.

Let's try spin recovery. A fully developed spin stopped within a quarter of a turn when the controls were centralised.

Now to see how she would fly aerobatics. Loops are easy – smooth and dead straight. I even flew consecutive loops with no trouble. Rolls are slow and graceful but you do need to use elevator in the inverted position to keep them axial. Needless to say, Cuban Eights can be flown until you are bored stiff. Inverted is very easy to fly but does need a bit of down elevator to hold it there. Flick rolls are possible but tend to be slow and a little untidy. I flew a couple of avalanches, which are loops with a flick roll at the top. Very satisfying but they take a lot of work to get right.

She would not fly outside loops. I think that she would with a lot more down elevator but the attempts from a great height failed about three quarters of the way round.

Stall turns are a delight to perform. Climb vertically until the model has just about stopped, hit full rudder and she swings over crisply.

Finally, I tried my favourite manoeuvre, the 'Clover Leaf'. This takes a special sort of model to fly the way I do it...

Fly a complete loop and continue until the model is pointing down again, do a quarter roll and fly another loop with a quarter roll on the way down. Repeat until you have flown four loops at 90° to each other. This manoeuvre is easy enough if the quarter rolls are on the upward part of the loop but is much harder when they are on the downward side. In that case a fast model tends to lose more height and the loops get lower and lower.

Finally came the landing, after a long steady and very flat approach to a smooth touchdown.

This model performs in a very scale like manner. Nothing fast and furious but it performs very graceful and positive aerobatics. There are some models that just have that little special something. This is one of those, as far as I am concerned.

### Building

There is nothing complicated or tricky in the construction. About the only technique that some people may not have used before is the rolled sheet on the turtle deck. Right, let's get started on the fuselage.

Mark and cut out the sides, doublers and formers. Glue the 1/4" sq along the bottom of the sides at the rear. Glue the two pieces of F-2 together and drill the holes for the U/C binding wire.

Take the straight 8 SWG nose leg and bend it as shown. Note that the rear view is shown on the plan so you can lay it flat on the drawing for marking. Bind this to F-2 with thin wire. I strip telephone extension cable but 15 amp fuse wire would do.

### Top Tip

Fold the wire until you have about six or eight strands, bend in half and push this through the two holes and round the wire, twisting together over the wire. Solder this together and to the U/C, making sure that the solder flows all the way round the wire. Repeat for each pair of holes.

Join the side with Formers F-2, F-3 and F-4. Leave to dry. Prepare F-1 by fitting the blind nuts for the engine mount.

Pull the rear of the fuselage in and join with the scrap balsa infill as shown and add rear formers. Pull the nose in and join with F-1. It is vital that F-1 is at 90° to the centre line.

When dry cut and fit the 1/4" sheet treblers. Fit the 1/4" sq spines. Add the cockpit floor and F-3a. Install the snake outers and tube for the aerial. Glue them in place with R/C Modellers glue.

The rolled sheet is easy. Select sheet that bends easily across its width. Glue the pieces down to the sides and just at the base of the formers, and leave to dry thoroughly.

Once dry wet the outside of the sheet and apply heat with a heat gun whilst gently bending the sheet over to touch the formers and spine. Trim to the centre of the spine and repeat for the other side. Once you are sure that they touch the formers and spine accurately glue them in place.

Sheet the bottom of the fuselage with 1/16" sheet, with the grain across the fuselage. Fit the 1/8" ply tailwheel mount. Add the 1/4" sheet underneath between F-1 and F-2.

Spot glue scrap 1/4" sheet in place of the fin and tailplane, and spot glue block in the corners. Shape to match the fuselage. When these are separated they will make perfect fairing blocks for the fin and tailplane.



The wing is built on the lower sheet and capstrips, which ensures a warp free structure. Marks on the plan show the rib locations



## FOURNIER RF-7

The drawing shows the cowling with apple cheeks on both sides. I only used one and left the engine exposed for easy servicing. Any apple cheek on the right side would be very flimsy when hollowed out enough to clear the engine.

Mount the engine on F-1 and spot glue the cowl front to the rear of the spinner backplate with 1/16" balsa spacers. Cut and fit 1/2" sheet between this and F-1 on the sides, top and bottom. Add the apple cheek.

Remove the engine and shape the cowl to match the cowl front and F-1. Hollow out the intake of the apple cheek. I found this area useful for adding lead to get the balance point right.

Finally glue 1/4" x 1/8" hardwood along the sides of the cockpit area to take the screws that hold the canopy in place.



*I covered the model with Solarfilm Supershrink Polyester*



*The completed right wing is joined to the left wing, which is still pinned down. The top sheeting is being applied to the left wing here. Note the clothes pegs holding the sheet to the spar*

### Wings

The wings are built using a sequence which I have developed and which guarantees no warps.

There are sixteen wing ribs on each side and Traplet can provide you with a nice set as part of the laser cut wood pack.

Start with one wing by laying down the leading edge sheet, the centre section sheet, the aileron spar and aileron leading edge capstrips and all the rib capstrips, including those for the aileron ribs. Then glue down the lower 1/4" sq spar. Laminate R-1 and R-1a.

Glue on all the ribs and leave to dry.



*The Super Custom 30 FS is perfect for this model. A two stroke could be used, either a good .20 or a 'cooking' .25*



*The cowl's apple cheek adds character*

Angle R-1 slightly to allow for the dihedral. Do not glue the lower LE sheet to the ribs at this stage. Next, fit the top spar and the aileron spar and aileron LE.

Chamfer the lower edge of the 1/8" sheet LE to match the angle of the lower edge of the ribs and glue in place, flush with the bottom of the ribs. Fit the trailing edge, trimming the capstrips and ribs if necessary.

Bring the lower leading edge sheet up to meet the 1/8" sheet LE and ribs and glue in

place. A length of trailing edge stock works well. I have a box of TE offcuts that I use as wedges. I use aliphatic glue to glue the sheeting to the LE and CA to glue it to the ribs.

Glue in the dihedral brace and add all the webs in front of the spar. Glue in the hardwood blocks for the outriggers. Add the 1/8" sheet gussets and the scrap blocks for the hinges, also the infill where the wing bolts go through the wing.





*Outriggers are made from the tube in Mr Muscle Multi Task Kitchen Cleaner, which has thick walls and is nice and stiff*

Using a razor plane, shape the leading edge and aileron spar and leading edge to blend with the ribs.

It is a good idea to install the bellcrank with its pushrod on its mount at this stage. Now add the top leading edge sheet, centre section sheet, the aileron spar and leading edge capstrips and all the rib capstrips. I use masses of clothes pegs to hold the sheet to the main spar and map pins to pin it to the leading edge. The short pins with big heads ensure that it is held firmly in place.

The first wing is now complete. Repeat the process for the second wing, leaving out R-1/R-1a at this point (not forgetting to make one left and one right) up to the stage of fitting the top sheeting.

Now join the completed wing to the second one, propping up the tip by  $2\frac{3}{8}$ " from the board and leave to set. Glue R-1/R-1a in place against the other wing.

Fit the bellcrank and then complete the sheeting and capstrips. When dry you can lift the completed wing from the board.

Separate the ailerons and shape the leading edge of these as shown. Trim the leading edge sheet flush with the  $\frac{1}{8}$ " sheet LE and add the leading edge capstrip. Laminate the tips from soft  $\frac{1}{2}$ " sheet and shape roughly. Glue in place and when dry bring to final shape.

Fit the  $\frac{1}{8}$ " ply plates flush with the bottom of the ailerons to take the horn screws. Temporarily fit the ailerons and make up the pushrods. Cover the bottom of the bellcrank bay with  $\frac{1}{64}$ " ply, with a slot for the pushrod. It should be possible to fit and remove the pushrod through the slot; this makes covering much easier.



*The trim was done with film, while the lettering was done with Solartrim*



*This model performs in a very scale like manner and performs very graceful and positive aerobatics*



## FOURNIER RF-7

Fit the ply plate under the wing to take the wing hold down bolt heads. Make and fit the aileron servo mount. This is from 1/8" lite-ply. The servo is mounted using Radio Active servo mounting brackets. The wing is now ready for covering.

### Tail Assembly

The tail is cut from 1/4" sheet. Use light but stiff wood for the tailplane and fin, and use very soft wood for the elevators and rudder.

The fin has little structural support where it joins the fuselage so I fit a length of 1/4" dowel into it, which goes into the scrap block at the rear of the fuselage. This makes for a solid connection.

The elevators are joined with a 14 SWG joiner.

### Covering And Trim

I covered the model with Solarfilm Supershrink Polyester. This covering takes far more heat than normal Solarfilm and I have yet to burn a hole in it with a heat gun. It also stays tight, even in blazing sunlight.

The trim was done with film while the lettering was done with Solartrim. The checks on the rudder presented a problem. In the end I went to a local sign shop and scrounged some of the application tape used to apply vinyl lettering. Then I carefully cut out all the checks and removed the unwanted ones, a very monotonous job. I placed the application tape onto the checks and lifted them from the backing paper, and applied them to the rudder.

The trim at the nose was done in the following way. I applied masking tape over the area and carefully trimmed it to shape. I ironed on the trim covering, then using the raised edge of the masking tape I cut the trim just over the tape. I could then remove the masking tape and iron the covering down round the edges.

The lettering was done by printing out the letters and enlarging them on the copier. This was stuck down to the Solartrim with Prittstick and the letters were cut out, leaving the backing paper as intact as possible. More application tape was used to apply them. The paper was removed by wetting it to soften the Pritt Stick.

### Installation

Once the model has been covered the tail parts can be glued in place.

I like to hinge the controls next. I used Great Planes small Pivot Point Hinges because even the small ones have metal pins, which will not separate.

The aileron horns are the normal kind held on with small screws. For the tail controls I prefer SLEC Neata horns.

The servos are located as shown on the plan. I make a up a small trebler, which makes small sockets which support the servo bearers firmly.

The snakes are made up to fit. These days I use Dubro Laser Rods, available from J Perkins stockists. The reason for this choice is that they do not change length when the temperature changes, unlike many other types which do and can cause trim changes.



*Showing off her clean underside during an overhead pass*



*There are some models that just have that little special something. This is one of those, as far as I am concerned*



*A long, steady and flat approach leads to a smooth touchdown*



As a starting point the control throws are:

**Ailerons** - High rate, 5/8" each way.

Low rate, about 7/16"

**Elevator** - High rate, 5/8" each way.

Low rate about 1/2"

**Rudder** - High rate 2".

Low rate about 1 1/4"

The ailerons are small and the span is long, so the large throws are necessary. I found the high rate fine on elevators but it took my test pilot, Stuart Pickett by surprise, although he was happy enough after a short time. Low rate on the rudder is fine for normal flying but the high rate is better for stall turns and taxiing.

The tank is sealed into the hole in F-1 with Solvol Silicone Gasket. This seals the hole effectively but allows the tank to be removed easily.

The Super Custom 30 FS is the perfect engine for this model. It would fly on a .26 FS but it would lack that little extra edge. A two stroke could be used; either a good .20 or a 'cooking' .25 would give more than enough power. This model flies on the wing, not the engine.

The spinner should be yellow. At the last minute I found that the intended spinner rubbed on the cowl and so I used what I had, which was an Irvine 2" spinner with a metal backplate.

The canopy is a moulding, which is available from Traplet Publications. I made a pattern from a large piece of pine and moulded mine.

The outriggers are made from the tube that you get in Mr Muscle Multi Task Kitchen Cleaner. This tube has thicker walls

and is stiffer than most of the others. And the cleaner is perfect for cleaning models!

Check the balance point, which should be 2 3/8" back from the leading edge at the wing root. Check the weight; if it is 3 lb 12 oz give yourself a pat on the back!

### Summary

The Fournier RF-7 is very close to scale and it flies in a scale like manner. There are some models that are just that little bit better than most as far as flying goes, and this is one of them.

To answer the perpetual question. Yes, I expect that she would convert to electric but I won't until the original is powered by an electric motor...

**RCMW**

*This article is a revised version of an article that was first published in RC Model World, September 2007.*



*A direct comparison between the full size and the model. You can see my minor errors easily here!*

## RC MODEL WORLD DETAILS

### MODEL SPECIFICATIONS

<b>PLAN NAME:</b>	FOURNIER RF-7
<b>SCALE:</b>	1:6
<b>WINGSPAN:</b>	62" (1575 mm)
<b>LENGTH:</b>	39" (990 mm)
<b>WEIGHT:</b>	3 lb 12 oz (1680 g)
<b>ENGINE:</b>	26 - .32 four stroke, .15 - .20 two stroke
<b>RADIO FUNCTIONS:</b>	Throttle, Ailerons, Elevator, Rudder

### BASIC CONSTRUCTION MATERIALS:

Balsa and Ply

**COVERING MATERIAL:** Solarfilm Supershink Polyester

**CENTRE OF GRAVITY:** 2 3/8" back from the LE at wing root

### CONTROL THROWS:

**AILERONS** - High rate, 5/8" each way. Low rate, about 7/16"

**ELEVATOR** - High rate, 5/8" each way. Low rate about 1/2"

**RUDDER** - High rate 2". Low rate about 1 1/4"

### PLAN DETAILS

<b>NAME:</b>	Fournier RF-7
<b>BUILD CATEGORY:</b>	Intermediate
<b>PLAN NUMBER:</b>	MW3281
<b>PLAN PRICE:</b>	£15.99 (US \$23.99)

### OPTIONAL PART

<b>NAME:</b>	PETG Canopy For RF-7
<b>PART NUMBER:</b>	CA3281CY
<b>PART PRICE:</b>	£8.99

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# SAITO FG-40



*This marvel of miniature engineering was supplied to us to power a large petrol powered aerobatic aeroplane, the kit review of which we will be bringing to you soon. But before it disappears inside the model's cowling we thought that you would enjoy a closer look at one of Saito's latest petrol engines*

*The distinctive gold and black box*



*Exposed pushrods and chromed rocker covers look good when sticking out of the cowling of any model, especially a scale type*

**I**n aeromodelling, as in life, you can buy some rubbish products that don't work very well at all, or you can buy mainstream items that offer reasonable performance at a very good price, or you can push the boat out and purchase some top end products that excel not only in terms of performance but in their quality too.

As far as model engines go there's little doubt that Saito four-stroke engines fall into the last category. They are far from cheap, but they are top notch in terms of engineering excellence and they are known to be robust and reliable, provided that they are set up correctly and care is taken to follow the correct break-in procedure.

A big contributory factor in this is that they are still manufactured in Japan, inside a small factory based in the Chiba prefecture on the outskirts of Tokyo. Here, on the ground floor, modern CNC machines are packed tightly alongside some old faithful lathes and milling machines and is where they turn out small batches of high quality components under the careful supervision of their experienced operators. Upstairs, under the roof, the engines are carefully assembled by hand. Again, they are made in relatively small batches so that the highest standards are maintained.

With the rapid rise in popularity of electric models there is always the concern that



*The engine mount is just 86 mm wide so this large engine is relatively slim and ideal for slimline installations. But be careful to purge any airlocks if you mount it upright or inverted*



traditional model engineering companies like Saito Seisakusho, Co., Ltd may be facing tough times. But the truth is that by sticking to their quality ethos they are, in fact, thriving, as there are many modellers who still prefer to use IC engines to power their models, especially in the larger aeroplanes that are becoming more commonplace. And this has created new opportunities as many of these modellers have turned to petrol engines to power their large models.

Many of these power plants originate in China and are soaked up by the mainstream market where their relatively low cost has to be balanced by a realistic expectation of what can be provided both in terms of reliability and quality. Saito were quick to recognise that there was a gap at the top end of the petrol engine market and just a few years ago they began to slowly introduce a new range of FG series petrol fuelled four-strokes that had instant appeal to those aeromodellers seeking a top quality petrol engine.

Our particular engine is the Saito FG-40 of 40.2 cc displacement.

### Engine Overview

Most Saito engines sold by the UK distributor, MacGregor Industries, are supplied in a distinctive gold and black box. Saito also mark the crankcases of each engine they produce to identify the country where a batch of engines have been distributed too. Returns of such good quality engines such as these are rare but in this way it is possible for the regional distributors to identify if they dealing with a 'grey' import.

Inside the box the engine is wrapped in a large sheet of bubble wrap. A smaller package contains a neatly cast cylindrical muffler, complete with manifold, as well as the electronic ignition unit and a small tool kit. There is also a long 'choke' wire that is provided for the choking the carburettor when hand starting. However, when using an electric starter, choking the engine should not be necessary as the action of spinning the starter will be enough to suck sufficient fuel to prime the engine.

### If You Can't Stand The Heat...

As we have come to expect from this leading engine manufacturer the quality of the castings is of the highest order, with a clean, matt finish on the aluminium exteriors of both the crankcase and the one-piece cylinder/head. The combined cylinder and head have long been a signature feature of Saito engines and this version is deeply finned to provide good cooling of this powerful engine, which will often find itself buried within a cowling.

Since adequate cooling is paramount to getting the best out of the engine it is important to follow the instructions provided, which detail ways of adding baffles inside the cowling so that air is forced over the head. If you just leave the inside of the cowling open then the heat can build up and cause problems for any petrol engine, not just this one.

Another important factor in distributing heat is the use of the correct engine mount;

hence the FG-40 is supplied with a cast aluminium mount that is already screwed to the engine bearers. Since this is designed to soak heat away from the engine it has to be in solid contact and so there are no rubber isolation blocks to absorb vibration. Again, the instructions are very explicit about what is required and this might require beefing up of the firewall if necessary so that it can deal with the torque and vibrations inherent in a large, single cylinder, four-stroke petrol engine.

The forward facing pushrods and cam gear housing are another distinctive feature of Saito engines, and the rods lead up to a pair of shiny, chrome finish rocker covers. These covers, combined with the pushrods and the tapered styling of the fins on the head, give these engines a most realistic scale aero engine appearance – at least for those parts that may end up sticking out of a cowling!

As such they do look good when mounted

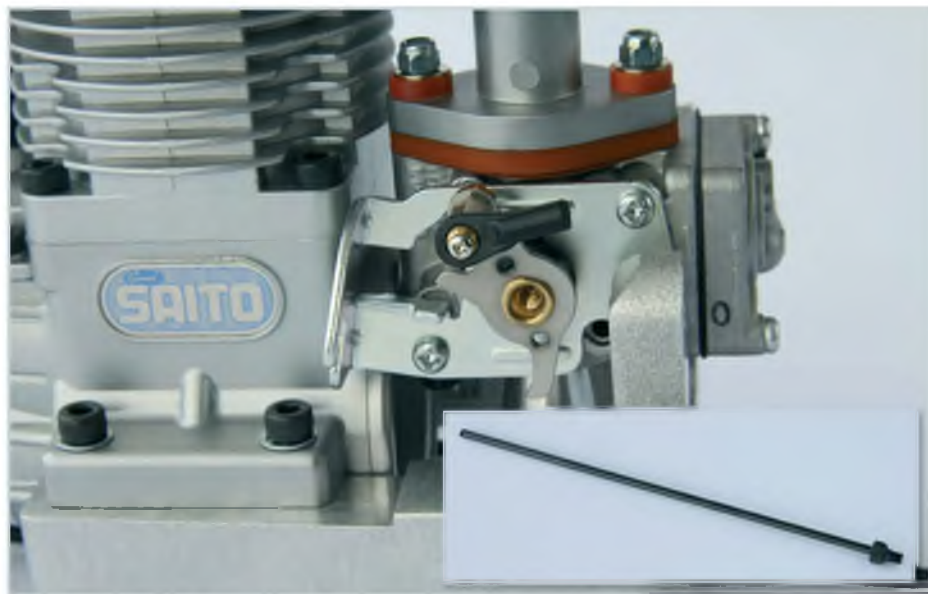
sidewinder in an appropriate airframe, especially if a dummy cylinder of similar style is made up to project from the other side, Lycoming style. Of course, if you really want to push the scale boat out then you can always fit a Saito twin!

### Electronic Ignition

The spark plug is inclined backwards and threads into the rear of the cylinder head. It is a genuine NGK CM-6 plug, so be wary of replacing it with cheap copies if you want to maintain reliability. The spark plug cap is heavily shielded to minimise interference with the radio gear and leads back to the Electronic Ignition System, which is encapsulated within a sturdy metal box. As with everything else on this engine the ignition system oozes quality and besides the sensor wire, which plugs into the rpm sensor that is factory fitted underneath the engine, it also features a rpm signal output wire so that it can be connected to either a



*Overall length from the tip of the crankshaft to the rear of the mount is 214.5 mm*



*The choke bar (inset) needs to be screwed into the centre of the throttle arm so that the choke can be pulled out and the engine primed for hand starting*



hand held tacho or more commonly these days, to a tachometer telemetry sensor for monitoring rpm in flight. The ignition system can be powered by a 5-cell NiMH or a 2-cell LiPo pack.

The sensor housing beneath the crankcase is slotted so that it can be moved either clockwise to advance the spark timing or counterclockwise to retard it. It is factory set in the central position. Retarding the timing will make the engine easier to start by hand but this comes at a penalty in the form of a slight loss of maximum speed. If you use an electric starter then the FG-40 should be easy to start with the sensor at any point across its range and you might be tempted to advance the timing so that you can obtain maximum power. But then the engine will be impossible to start by hand, so it is worth not overdoing this so that you retain the ability to hand start should you ever have any problems with your electric starter and/or its battery.

A length of spiral cable wrap is provided and this should be used to protect the wires from heat where they inadvertently touch either the engine or the engine mount. A pair of servo lead locks are also provided to make sure that the cables stay connected during flight and cannot be shaken loose by the engine's vibrations. It is worth taking a hint from this and fitting such lead locks to all servo connections inside the airframe!

### **Walbro Carburettor**

Saito have taken no risks where the carburation is concerned so it is great to see a Walbro carburettor installed on the back of this engine. The FG-40 is rated as having a fuel flow of around 30 cc per minute at full throttle, so the recommended 500 – 600 cc fuel tank should easily give between 15 to 20 minutes of flying, depending on the propeller used and the engine settings. A 20" x 8" prop is recommended for general use.

Fuel is a petrol/oil mixture at a ratio of 20:1, which means that every 1000 ml of petrol should be mixed with 50 ml of good quality two-stroke oil. A slightly richer oil content can be used if you prefer, but certainly no less than the recommended amount.

Of course, being a petrol engine it is important to use petrol proof tubing, as well as a gasoline resistant fuel tank and fuel pump.

The instructions caution that because the valve timing is designed for high power and high speed it is possible for raw fuel to be blown back from the carburettor. In addition there will be some waste oil expelled from the breather nipple, as well as a certain amount of lubrication oil oozing out of the joints between mating parts. All this is no different to any other IC engine, but it does indicate that some additional fuel proofing is well worth attending to in the engine bay and especially around the firewall to fuselage joints

### **Running In**

All Saito engines benefit from a good period of running in. This involves running it with a rich mixture so that all the internal



*Quality construction extends to the use of a Walbro carburettor*



*The rear inclined spark plug is a genuine NGK product*



*Be sure to use the mount provided for cooling purposes. It needs to be rigidly mounted to cope with the torque and vibrations produced by this impressive engine*



*The sensor mount is slotted to enable the spark timing to be advanced for maximum power or retarded for easy hand starting*



moving parts become well lubricated and honed as much as possible before the mixture is leaned out and the engine is tuned for peak performance.

Following the first start (at about 1/4 throttle) the main needle is quickly opened by two turns to richen the mixture and the throttle is opened. The aim is to keep the engine running for more than one tank of fuel with as rich an air to fuel mixture as possible at full throttle without it cutting out. It will not run very smoothly, but stick with it as it is better for the engine in the long run!

Subsequent tanks can then be run through whilst introducing brief spells of leaning out the main needle before returning to a rich setting. The lean periods can then be lengthened until the engine holds a stable rpm at high speed. A final tankful should then be run through at high speed and then the engine is ready to fly.

Obviously, it pays to keep the mixture slightly rich during early flights to help continue the running in process, but not so much that you run the risk of rich cuts. For this reason early flights should also be conducted at a good height, just in case the engine does cut, and so giving you plenty of height to prepare for a dead stick landing.

After operating the engine for an hour the valve clearances can be checked and adjusted if necessary using the tools and the 0.1 mm feeler gauge supplied.

## Starting

The recommended method of starting the FG-40 is by using an electric starter. After switching on the radio the throttle is closed before switching on the ignition system (this needs to be off before filling the tank with fuel). The throttle can then be opened to around 1/4 open and the starter applied. After about five seconds the engine should draw enough fuel to start.

Alternatively, it can be started by hand, using a stout pair of gloves and a chicken stick. With the throttle closed choke the carburettor by screwing the choke bar into the thread at the centre of the throttle lever. (If you intend to cowl the engine it would be well worth rigging up some sort of guide and support near to the throttle lever otherwise it might be next to impossible to aim the long choke wire accurately!) The choke can then be pulled out and the choke bar clamped in position (a wheel collet would be good for this).

Using a gloved hand the prop should then be rotated in the forward direction (CCW) until you hear hissing from the carburettor. This indicates that fuel has reached the engine. Rotate the prop until you hear another five hisses, and then the prop can be quickly flicked over for about another 10 times. The choke bar can then be disconnected and the ignition system switched on. After opening the throttle by about a quarter the engine can then be flick started – using the chicken stick rather than your fingers! Let it run for about 10 to 20 seconds before further opening the throttle.

When you have finished flying for the day you need to make sure that the engine is



*Crankshaft markings identify such things as the regions in the world where the engines are intended to be distributed*



*Each engine is supplied with a small but neatly finished muffler and a short manifold that can be positioned anywhere in a 360 degree arc. Lock nuts secure the manifold between the engine and the muffler*



*The electronic ignition system is well shielded to protect the radio system from noise*

run dry so that the carburettor is cleared of fuel. Then switch off the ignition and drain any remaining fuel from the tank. Next, open the throttle and apply your starter to blow out any un-burnt fuel and exhaust residue remaining in the engine. Besides protecting the carburettor from gumming up, this procedure will also help protect the engine from internal corrosion.

At the start of the next flying session you may find that, initially, there is an air lock inside the carburettor, which can cause

the engine to cough or, in extreme cases, to stop in flight. This usually only happens with upright or inverted installations, sidewinder mounted engines should be okay as any airlocks will automatically be purged as the engine starts and idles.

To purge the engine ready for the first flight you need to let it idle for a couple of minutes, then set a medium to high throttle setting. The model can then be firmly picked up and rotated such that the metering chamber (on the side opposite to



## SAITO FG-40

the throttle arm) is pointing downwards. The engine may then cough or stop, but the air will be purged from the carb until you cut the fuel again at the end of the flying session (or if you accidentally let the tank run dry).

Since the engine will need to run at a high throttle setting you may want to get someone to help you. And even then, with larger models it may not be safe to purge the carburettor on the ground. So with a big airframe it may be best to take the model up high after take-off and then roll it into knife-edge or a steep bank so that the metering chamber is pointing at the ground. After it coughs you can begin flying aerobatics, but if it cuts at least you have good height to plan a good dead-stick landing!

### Summary

The Saito FG-40 is a superb piece of model engineering. It oozes quality throughout and we eagerly await the completion of the test airframe so that we can begin using this fine engine for the purpose that it was designed – flying a large model aeroplane.

We'll keep you posted on how easy it is to break-in and how it performs when it is in the air. **RCMW**

## MODEL WORLD DETAILS

### PRODUCT INFORMATION

<b>NAME:</b>	Saito FG-40
<b>MANUFACTURER:</b>	Saito Seisakusho, Co., Ltd
<b>DISTRIBUTOR:</b>	MacGregor Industries Ltd
<b>WEBSITE:</b>	<a href="http://macgregor.co.uk/saito.htm">http://macgregor.co.uk/saito.htm</a>
<b>PRICE:</b>	£699.95 SRP
<b>PRODUCT TYPE:</b>	Four-stroke petrol engine
<b>PARTS SUPPLIED:</b>	Engine, spark plug, electronic ignition system, metal engine mount, muffler and manifold, tool set, wire wrap
<b>PARTS REQUIRED:</b>	Propeller, fuel, 5-cell NiMH or a 2-cell LiPo pack to power ignition system

### PRODUCT SPECIFICATIONS

<b>BORE:</b>	40.0 mm
<b>STROKE:</b>	32.0 mm
<b>STROKE VOLUME:</b>	40.2 cc
<b>WEIGHTS:</b>	Engine – 1,260 g Muffler – 85 g Engine Mount – 260 g Ignition System – 110 g
<b>PRACTICAL SPEED:</b>	1,700 to 8,000 rpm
<b>PROP:</b>	19 x 10" to 21" x 10" (20" x 8" recommended)
<b>FUEL:</b>	petrol: oil = 20:1 (volume ratio)
<b>FUEL FLOW:</b>	Approx. 30 cc/min (at full throttle, approx. 8,000 rpm)

### LIKES

Oozes quality • Good instructions  
Cannot wait to fire it up!

### DISLIKES

None so far!



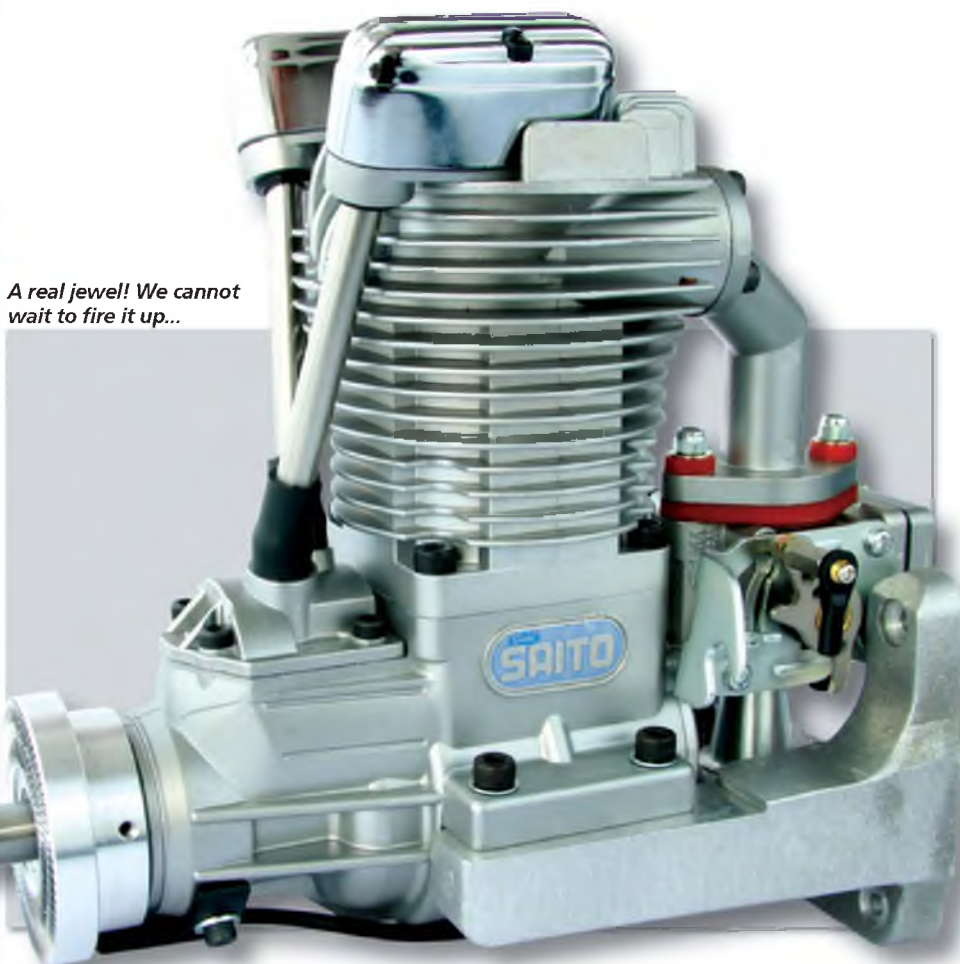
A bundle of wire wrap is provided to shield the wiring from touching hot surfaces. The lead locks should be used to prevent the connectors from disconnecting due to vibrations



A small but comprehensive tool set is provided



Every Saito engine is provided with comprehensive instructions, a sheet of stickers and a brochure to inspire you when considering the purchase of your next engine!



A real jewel! We cannot wait to fire it up...



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# Ripmax

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Check through the specifications below and we are sure you will agree!

## Digital Holding Power!

Servo	Dimensions	Type	Voltage	Speed Seconds/60°	Torque	Weight	Motor	Gears	Case	Price
P-QZ101	23 x 12 x 27mm	Digital	4.8 - 6.0V	0.08 sec @ 4.8V 0.06 sec @ 6.0V	2.54 kg/cm @ 4.8V 3.11 kg/cm @ 6.0V	20.3g	Regular	Aluminium with TiCn +brass	Aluminium	£25.99
P-QZ201	30 x 10 x 35.5mm	Digital	4.8 - 6.0V	0.16 sec @ 4.8V 0.13 sec @ 6.0V	5.85 kg/cm @ 4.8V 7.21 kg/cm @ 6.0V	26.2g	Regular	Aluminium with TiCn +brass	Aluminium	£22.99
P-QZ202	30 x 10 x 30mm	Digital	4.8 - 6.0V	0.13 sec @ 4.8V 0.11 sec @ 6.0V	4.51 kg/cm @ 4.8V 5.56 kg/cm @ 6.0V	23.1g	Regular	Aluminium with TiCn +brass	Aluminium	£21.99
P-QZ203	30 x 10 x 30mm	Digital	4.8 - 6.0V	0.13 sec @ 4.8V 0.11 sec @ 6.0V	4.51 kg/cm @ 4.8V 5.56 kg/cm @ 6.0V	22.5g	Regular	Aluminium with TiCn +brass	Aluminium	£21.99
P-QZ301	36 x 15 x 32.4mm	Digital	4.8V	0.06 sec @ 4.8V	2.54 kg/cm @ 4.8V	25.32g	Coreless	Plastic	Plastic & Aluminium	£14.99
P-QZ302	36 x 15 x 32.4mm	Digital	4.8 - 6.0V	0.11 sec @ 4.8V 0.09 sec @ 6.0V	5.5 kg/cm @ 4.8V 6.6 kg/cm @ 6.0V	26.32g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£19.99
P-QZ303	36 x 15 x 32.4	Digital	4.8 - 8.4V	0.06 sec @ 4.8V 0.04 sec @ 8.4V	3.54 kg/cm @ 6.0V 4.52 kg/cm @ 7.4V	26.32g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£21.99
P-QZ304	35.5 x 15 x 28mm	Digital	6.0 - 7.4V	0.07 sec @ 6.0V 0.05 sec @ 7.4V	4.83 kg/cm @ 6.0V 6.25 kg/cm @ 7.4V	34.1g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£44.99
P-QZ501	40.5 x 20.2 x 38mm	Digital	4.8 - 6.0V	0.15 sec @ 4.8V 0.13 sec @ 6.0V	8.65 kg/cm @ 4.8V 9.35 kg/cm @ 6.0V	62g	Regular	Aluminium with TiCn +brass	Plastic & Aluminium	£12.99
P-QZ502	40.5 x 20.2 x 38mm	Digital	4.8 - 6.0V	0.16secs @ 4.8V 0.14secs @ 6.0V	17.25 kg/cm @ 4.8V 20.32 kg/cm @ 6.0V	62g	Regular	Aluminium with TiCn +brass	Plastic & Aluminium	£13.99
P-QZ503	40.5 x 20.2 x 36.5mm	Digital	4.8 - 6.0V	0.08 sec @ 4.8V 0.06 sec @ 6.0V	3.71 kg/cm @ 4.8V 4.45 kg/cm @ 6.0V	49.4g	Coreless	Plastic	Plastic & Aluminium	£29.99
P-QZ504	40.5 x 20.2 x 36.5mm	Digital	4.8 - 6.0V	0.12 sec @ 4.8V 0.10 sec @ 6.0V	11.53 kg/cm @ 4.8V 13.83 kg/cm @ 6.0V	61g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£31.99
P-QZ505	40.5 x 20.2 x 36.5mm	Digital	4.8 - 6.0V	0.07 sec @ 4.8V 0.05 sec @ 6.0V	6.62 kg/cm @ 4.8V 6.73 kg/cm @ 6.0V	72g	Coreless	Aluminium with TiCn +brass	Aluminium	£49.99
P-QZ506	40.5 x 20.2 x 36.5mm	Digital	6.0 - 8.4V	0.062 sec @ 6.0V 0.048 sec @ 8.4V	5.71 kg/cm @ 6.0V 7.22 kg/cm @ 8.4V	58.4g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£32.99
P-QZ507	40.5 x 20.2 x 36.5mm	Digital	6.0 - 8.4V	0.095 sec @ 6.0V 0.072 sec @ 8.4V	8.75 kg/cm @ 6.0V 11.25 kg/cm @ 8.4V	59.3g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£32.99
P-QZ508	40.5 x 20.2 x 36.5mm	Digital	6.0 - 8.4V	0.12 sec @ 6.0V 0.10 sec @ 8.4V	17.25 kg/cm @ 6.0V 20.32kg/cm @ 8.4V	59.3g	Coreless	Aluminium with TiCn +brass	Plastic & Aluminium	£32.99
P-QZ509	40.5 x 20.2 x 36.5mm	Digital	6.0 - 8.4V	0.12 sec @ 6.0V 0.10 sec @ 8.4V	19.25 kg/cm @ 6.0V 23.93 kg/cm @ 8.4V	72g	Coreless	Aluminium with TiCn +brass	Aluminium	£49.99
P-QZ601	60 x 29 x 57.1mm	Digital	6.0 - 7.2V	0.20 sec @ 6.0V 0.18 sec @ 7.2V	28.56 kg/cm @ 6.0V 30.35 kg/cm @ 7.2V	154g	Regular	Brass	Plastic	£34.99





**PHANTOM 2  
VISION PLUS V3**

# FLYING DRONES

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**INSPIRE 1**



**INSPIRE 1**

**PHANTOM 2  
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**PHANTOM**



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# MILLIE BOB

*Millie displays Bob, a model aeroplane that Tony Wright built especially for her*



**T**his model first appeared on a scrap of paper in 2002. I often used to sketch models at work; some of the sketches actually got built, the rest of the drawings were neatly stuffed in my toolbox. Fast forward to 2013, I was looking through my sketches and came across this design. My daughter, Millie had been nagging me to build her an aeroplane (she had become bored with R/C boats). So with that in mind the sketch was scanned and enlarged. Now 9 year old girls don't want to mess about with the ritual of starting an I/C engine, which can be quite off-putting, so electric it would have to be. This was my first serious attempt at designing an electric model aircraft, though I had built a couple of the GWS models with great success.

What set up to use? Whilst trawling through the pages of an internet site I came across a full electric outfit, which I got for a tenner. When the outfit arrived I set it up in the workshop and I was stunned by the gust of wind it provided. I have a built-in instinct and knew this would be ideal for the new model, which was quickly built.

Showing the bare bones of the model to Millie, I asked what we should call her new plane. "Bob", she said. The rest, as they say, is history...

## Building Of Bob

On with the build. The basic construction is very simple, so if I tell you how to do something blindingly obvious just remember this may be the first time someone has built from a plan.

We might as well cut the sheet parts first. There are several ways to mark the parts on to the balsa. Here are two of them:

You can use carbon copying paper — no explanation required. Or the pinprick method — z just lay the balsa wood under the part required then, using a pin, mark through the plan. All you have to do is join the dots with a ballpoint pen.

To cut the parts out get yourself a cutting mat (they don't cost much and they make the job a lot easier) and put a new blade



*Simple and fast to build, Millie Bob serves both as a trainer or as an introduction to electric power*





*Uncovered airframe showing the simple to build structure*



*The tail servos are mounted on wooden rails and use good old fashioned dowels as pushrods*

in your knife. Do be as accurate as possible when cutting the parts.

Building board requirements? Depending on how you wish to proceed there are two ways I can suggest. Number one is to get yourself a nice warp-free piece of soft wood. Or the method I use all the time now is to build on an off-cut of kitchen worktop. We can explore the merits of both types later.

A word on adhesives. I use cyano because I build very quickly. But you need to be very accurate with your joints (see photographs). If you are a beginner, I would suggest that you use PVA as it has better gap filling quality.

On with the build. Starting with the fuselage, the first job is the built up sides. If you are using a soft wood building board, lay the plan out, then to stop the wood

sticking to the drawing rub candle wax where a joint occurs. Or you can use clear tape for the same effect. Now pin the sheet parts to the plan, then add the strip parts. Cut each part as a pair; this will ensure that both sides are the same. Drill the holes for the wing retaining dowels using a sharp piece of metal tubing.

The second method I use is the off-cut of kitchen worktop. Instead of pins I use weights to hold the parts in position. I find this is a quicker method, but you must decide what is best for you.

Next produce a set of formers. We will need the landing gear now, so set to with a suitable length of piano wire, a vice and a hammer. I could not make the U/C any simpler. You can fix it to F2 with thread and a drop of cyano. Lay the sides on the building board as a pair, then onto one

side glue former F2. Next glue F3 to the other side, making sure the formers are quite square. Once the glue has done its work you can join the sides together, again keep everything square and accurate. Join the tail end of the fuselage together and add the rear cross braces. Moving up to the front end, fit F1, noting the side thrust. Sheet the underside of the fuselage. We can leave the construction of the fuselage for a bit now — all will become clear in a moment.

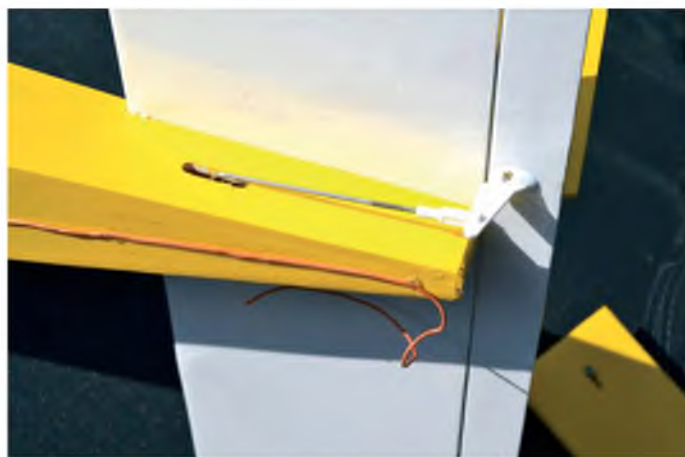
### **Tail Parts**

We need to make the tailplane, elevator, fin and rudder. A simple job, just build the parts over the plan like you did with the fuselage sides. The parts are sanded to section — see plan. Temporarily hinge the moving parts. I use Mylar as it is cheap and





*Front and rear canopy glazing. Note also the fitment of the wing dowels*



*The rudder and elevator linkages couldn't be simpler*



*Details of the battery bay, with and without a 3S LiPo*

reliable. Don't glue the hinges just yet, but do fit the rudder and elevator horns.

Now we can return to the fuselage. This early in to the build we can set about fitting the power supply, the servos and the motor. The motor used on my set up is a 22 x 28 outrunner with a 7" x 5" prop. The battery is a 3-cell, 11.1 volt 1500 mAh (80 x 35 x 18 mm) and a 30 amp ESC. Two inexpensive 9 gram servos operate the elevator and rudder.

Tack glue on the tail end parts. Mount the servos on wooden crosspieces. Make up the pushrods for the rudder and elevator (the plan will show you how). It's a lot easier to do now before the model is finished. Temporarily install the motor and check the wiring runs; please be neat. Guess what? Now you can remove the motor, servos and the tail end parts...

Carrying on with the fuselage, fit the nose blocks. Make up the battery hatch (see the plan for the fixing method). Then set with your sanding block. Hopefully you should end up with a neat straight fuselage.

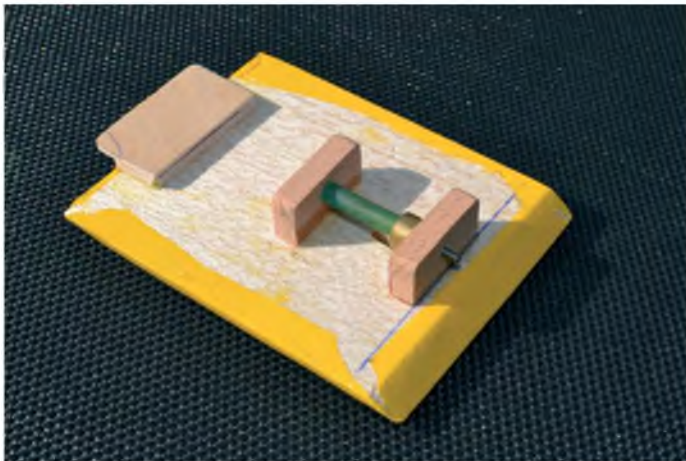
### Wing Next

The wing is next. Cut yourself a ply wing rib template. Use this as a guide to cut out the wing ribs. Take a length of trailing edge and mark the positions of the ribs off the plan. To cut the notches use a new, sharp knife. Cut each side of the notch, then flick the waste out with the tip of your knife. If you have a band saw or the like you won't need me to tell you what to do! Lay the TE on to the plan, secure it in position with pins. Or, as I do, with weights. Then using a rib or two, position the lower spars

(you use the ribs just in case there are any discrepancies between your cutting out and the plan). Glue the ribs to the TE and the lower spars, noting that the root rib is set at an angle to suit the dihedral angle. Add the upper spar, followed by the leading edge. You can now fit the wingtip parts plus the vertical webbing. Repeat for the other wing panel.

The centre section is just the same as the wing but it has ply dihedral braces and the top is sheeted. To assemble the wing, cut slots in the main wing panels to accommodate the dihedral braces. Weigh down the centre section, apply adhesive to the dihedral braces etc. and slide the wing panels onto the centre section. Prop the wings up at the right dihedral angle, then clamp the braces to the spars. It is best to use a slower setting adhesive for this part





*The battery hatch latch – simple and effective!*



*Don't forget to add a slot for the battery cooling air to exit*



*Millie Bob's clean and simple front end*



*The wing is banded on in traditional fashion*

of the show. After you have released the wing, set to with your sanding block for shaping the leading edge, wingtips etc.

Let's see what we have accomplished so far. You should have an 'Almost Ready To Cover' airframe. Not that difficult, was it?

### **Covering**

The windows are glazed first. Any thin, clear plastic sheet will do. Fix them in place with Modellers' Adhesive, which dries clear. If you want to use cyano, just be as neat as you can. For the actual covering I would recommend Solarfilm. Follow the instructions provided and you won't go wrong.

And, finally, we can refit the motor and the radio equipment. Remember to remove the propeller when testing the system.

The C of G should be in the right area, but if not add weight to the front or back as the case may be. If you don't get it right, it isn't going to fly well!

### **Flying Millie Bob**

I must say this model is one of the nicest models I have ever flown. It flies like it is on rails, which must be the damping effect of the large tail surfaces. What a pleasure it is just to turn up at the field, plug in the LiPo and fly. I'm hooked on electric! Does anybody want to buy a shed full of I/C models?

I like to fly around on half throttle, just relaxing. But if you open the taps it has a fair turn of speed. It is no 3-D flyer but for normal R/E/T manoeuvres it is just the job!

Next on the list is a low wing version of Bob with ailerons and an extra wheel at the front. What do you think?

I hope you like this model. For any additional information you may require, please contact me via email: [thepufango@gmail.com](mailto:thepufango@gmail.com)

**RCMW**

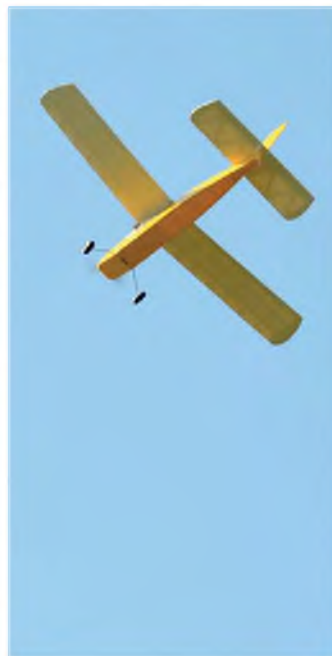


*A bit high on the approach, so power on and go around*





*This model reminds us that R/C models don't have to be complicated and chock full of tech to be great fun*



*Try guiding her around with minimal use of the controls – guided free flight!*



*Millie Bob potters past – delightful!*

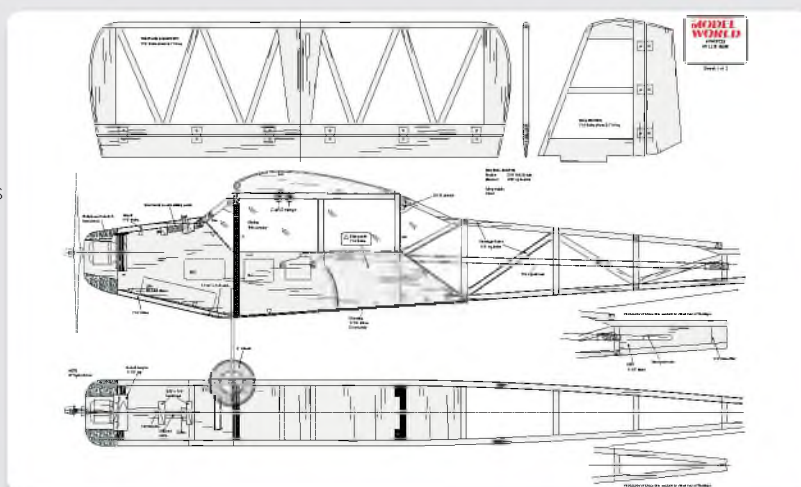
## PLAN DETAILS

**NAME:** Millie Bob  
**BUILD CATEGORY:** Beginner  
**PLAN NUMBER:** MW3723  
**PLAN PRICE:** £11.99 (\$20.99)

Plans and parts are subject to Postage and Packing charges at standard rates.

Copies of plan number MW3723 are available from RC Model World (Plans Service), Traplet Publications Limited, Traplet House, Willow End Park, Blackmore Park Road, Welland, Malvern, WR13 6NN, UK. Telephone: + 44 (0) 1684 588599, Fax: + 44 (0) 1684 578558, Email: [orders@traplet.com](mailto:orders@traplet.com) or order online at [www.trapletshop.com](http://www.trapletshop.com)

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*Let's finish with another picture of the proud lady pilot and her electric trainer*

## MODEL SPECIFICATION

**MODEL NAME:** Millie Bob  
**WINGSPAN:** 44" (1118 mm)  
**LENGTH:** 33.9" (860 mm)  
**WEIGHT:** 26 oz (737 g)  
**RADIO FUNCTIONS:** Throttle, Elevator, Rudder  
**SERVOs:** 9 g (two off)  
**BASIC CONSTRUCTION MATERIALS:** Balsa, Ply  
**COVERING MATERIAL:** Solarfilm  
**CENTRE OF GRAVITY:** 2" – 2.5" (52 - 64 mm) from Leading Edge  
**CONTROL THROWS:** Elevator: +/- 3/8" Rudder: +/- 3/4"  
**MOTOR:** 22 x 28 outrunner  
**PROP:** 7" x 5"  
**ESC:** 30 A  
**BATTERY:** 1500 mAh, 3S



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# BEBOP IN FLIGHT

*Parrot's latest camera drone takes to the skies to capture impressive aerial images*



*No, your eyes are not deceiving you. We had to swap to this red Bebop after our original yellow sample failed to retain images when the battery was disconnected. This one works a treat!*

In the last issue we introduced you to the new Parrot Bebop drone. However, our outdoor flight-testing was limited due to bad weather. Since then we have been out and about with this small four-bladed multicopter to see what it offers for budding aerial photographers.

Eagle-eyed readers may have noticed that our Bebop has changed colour. Our original yellow machine deleted all the videos and still images that had been recorded once its battery was unplugged. It should, of course, retain all images for downloading at any time after a flying session has finished, even when the flight battery has been disconnected. High praise then to Parrot's long-standing UK distributor, Flying Toys, who sent a replacement red Bebop as soon as this problem was reported back to them. And we are happy to say that the new Bebop has performed faultlessly during flight-testing.

## **Skycontroller In Use**

From an R/C modeller's point of view one of the most exciting aspects of the Bebop is the provision of the Skycontroller transmitter, which makes the whole experience much more akin to flying an R/C model. Previous Parrot drones had to be flown using the Free Flight app on a smartphone or tablet. This was not a hardship, and it proved to be quite easy once the basic principles had been digested and practiced in an open space. Indeed, the Bebop can also be flown this way too, tilting the smart device in the direction that you want the drone to travel. But we much prefer the R/C style stick units of the Skycontroller to guide our model when flying it outdoors.

But the Skycontroller is a heavy beast, especially when a tablet is clamped between the sticks to give an FPV viewpoint from the model, so we found the included

neck strap to be a 'must use' accessory.

The stick units are widely spaced, but the handgrips on which they are situated fall comfortably to hand so you soon forget about the unconventional appearance of the transmitter. Like a lot of UK model flyers we prefer to use square 'cuddle box' style Tx's, however the Skycontroller will feel more familiar to those who prefer to fly their models with rectangular, continental style transmitters.

To prepare the Bebop for flight without using a smart device to monitor the view from the camera, simply switch both the Skycontroller and Bebop on and after a short while they will automatically connect. The Bebop initialises quite quickly, but the Skycontroller takes a bit more time to cycle through its start up procedure. Eventually the LED monitor panels built into the arms of the unit settle down, and





*This is the view that you should get on your smart device's screen when the Free Flight app starts. If it's black then take the lens cap off!*



*Bird's eye view of the remains of a fruit orchard*

if all is well they will each display four bright white LEDs. On the left arm is the WiFi signal strength monitor, whilst on the right arm are battery monitors for both the Skycontroller and the Bebop drone.

If you want to see what the Bebop is looking at in flight then you need to clamp a smart phone or tablet between the sticks. You then get to see the view from the camera via the Free Flight app. The four point clamping system works well and it will safely hold a full size iPad or similar tablet whilst you fly the drone. Each clamp is fitted with a sponge pad to prevent damage to the case of the smart device.

The switch on sequence is a little bit different in that a WiFi connection is made first between the Skycontroller and the smart device. You do this by selecting the Skycontroller network from the WiFi network list in the settings menu of your phone or tablet. When the Free Flight

app is launched a WiFi Manager window appears and this shows a list of available networks. After the Bebop has initialised it will appear on the list and should connect automatically to give a First Person View from the drone's camera to your smart device's screen. You should get a nice close-up view of some blades of grass, but if the screen is black then you've probably forgotten to take the lens cap off!

### **In Flight**

Most of the virtual buttons that you see on the Free Flight app screen are replicated as physical buttons on the Skycontroller. These include the Take Off/Landing, Emergency, Return to Starting Point, Video Record and Photo Record buttons. But one omission is the Flat Trim button, so after finding a level area from which to take-off you should press the Flat Trim icon on the app screen.

As soon as the Take Off button, which is found just below the right-hand stick, is pressed the props will spin up and the Bebop will take-off and settle into a waist high hover. It will do this automatically, with no input needed from the pilot. When you are ready you can start to gently move the sticks; we would suggest trying one control at a time, maybe starting with pushing the left-hand stick forwards, which will increase the speed of the props and cause the Bebop to gain height; pulling the stick gently backwards will slow the props and the drone will descend. To rotate (yaw) the drone experiment with moving the left-hand stick left and right. When you have mastered the left-hand stick (and making sure that the drone is facing away from you), gently push the right-hand stick forwards and the Bebop will fly slowly away.





*Still images show a bit of barrel distortion at the edges due to the fisheye lens. But the video is processed to remove this, so the horizons are almost flat and the footage remains level, even when the Bebop is banked at an angle to counteract strong winds*



*A distant view of the beautiful Malvern hills*



*Views from on high pose interesting questions. For instance, our thin flying field turns out to be part of a larger, rectangular boundary that is bisected by the farm track. Could it be the site of a Roman fort?*



*The editor takes a selfie!*

Both sticks have soft return springs to automatically return them to their centre positions when they are released, so gently let the stick return to the centre; the Bebop will stop and hover. You can then pull the stick gently backwards to fly the drone slowly back towards its starting position. Finally, try the same gentle movements to the left and right, which will cause the Bebop to bank, and it will drift slowly in the commanded direction.

If you have flown a model helicopter before then you will find piloting the Bebop (and other drones) to be second nature, but aeroplane pilots will find that multirotor flying is easy too, providing you take your time to explore the effects of the controls, as described above. The only tricky thing to remember is that, like a helicopter, the 'rudder' has to be used to keep the model pointing in the direction of flight during turns, otherwise the drone will just crab across the sky. This is most likely to cause confusion when you start turning the model back towards yourself and the directional controls are reversed. However, unlike an R/C helicopter or a plane, if you get confused you can simply let go of the sticks and the drone will hover until you are ready to retake control. If it is facing towards you simply use the left stick to gently rotate it until it is facing away and in a more familiar position.

Chances are though, that if you are investing quite a considerable sum of money in a Bebop and Skycontroller combo then you will have got used to the basics of drone flying with a less costly machine. But if not it is quite possible to fly the Bebop as your first multicopter; just take baby steps

until you are happy flying it in gentle figure of eights before pushing the throttle stick hard forward and climbing up for some high-level film work.

If you do find yourself piloting the Bebop at a distance and/or at height, and get disorientated then it's time to press the Return to Starting Point button, which is situated next to the Take Off button on the right stick unit. The Bebop will spin around and will fly back until it is overhead the position at which you switched it on, using its GPS sensor. It will then descend to 2 metres above the ground and will hover there until you take back control. This is a great safety feature but you do need to make sure that you don't switch the Bebop on either in the car park or the pits at your local flying field, otherwise you could give other clubmates a bit of a shock - although the 2 metre ceiling should help it to avoid settling on the roof of your car!

### **Flight, Camera, Action!**

All the clever control mixing and GPS positioning that makes the Bebop so easy to fly also ensures that it's a stable camera platform too. But even the best control systems can only react to wind gusts, and so the drone needs to make constant adjustments to maintain its position and altitude. With less well equipped aerial platforms this means that the camera makes constant small movements too. But the Bebop has another trick up its sleeve, which is that the camera also has a 3-axis stabilisation system so the images remain level and stable regardless of any small movements made by the drone. It's not perfect but the HD 1080p video is very

impressive when compared to other drone footage that we have taken.

About the only thing that upsets it is when yawing the Bebop quickly, which results in a jerky panning action. You can also pan using the camera joystick on top of the right-hand stick unit to give a wide angle sweep of the lens but that can be a bit jerky too. The footage can also get a bit ragged when making a fast descent, which the Bebop makes in a series of steps. And while the camera system does its best to smooth things out, this is still noticeable in the footage.

For the smoothest video we found it best to let the drone settle into a stable hover and then we could concentrate on using the camera joystick to finely aim the camera at the best view. The record button was then used to record short bursts of each vista.

Still images can also be taken by pressing the camera joystick inwards. The Skycontroller emits a quiet 'shutter' sound when a picture is taken, but the drone is quite noisy and it is often difficult to hear this. There is also quite a long delay between pressing the joystick and hearing the shutter sound. Therefore, there's a tendency to think that you haven't pressed the joystick hard enough and to take more images than you really need until you hear that soft sounding click.

Using one of the settings menus you can opt to shoot either DNG or JPEG format files. Most people will be familiar with JPEG picture files as this is the standard format used by most digital cameras. But DNG is popular with photographers as it contains the raw data taken by the camera,



without any in-camera processing having been applied. The files sizes are 26,877 KB compared to just over 2,000 KB for the compressed JPEG files, so you can see how much extra information they contain. This gives much more freedom when post-processing the images, such as pulling details out of areas in deep shadow, but it does require the use of more specialised image editing software, such as Adobe Camera Raw or Adobe Lightroom.

Photographs taken close up exhibit quite heavy distortion due to the fisheye lens, but this becomes almost imperceptible when the drone is high up and taking wide angle views.



Those red props stand out well, but the main aid to orientation is actually the dual arms that support the front motors. These can still be seen when the Bebop is at quite a height

Experienced photographers will also appreciate the ability to change the White Balance and Contrast settings using the Image Settings menu within the Free Flight app. There's also a time lapse feature, which we have yet to fully explore. But it is intriguing as time lapse videos usually require the use of a tripod mounted camera, which ensures that it cannot move while it takes multiple exposures. So it will be interesting to see how the Bebop footage compares – it will be from a great viewpoint though!

Images can be retrieved either by plugging the Bebop into your computer's USB port using the lead supplied or by transferring them to the phone or tablet using the Internal Memory function of the Free Flight app.

### Other Features

Since the Bebop can operate using either 2.4 or 5 GHz WiFi it is possible to use the Network Settings screen to select the cleanest band on which to fly the drone. A coloured graph at the bottom of the screen shows the state of the bands, with congested channels highlighted in red and less congested channels shown in green. The current Bebop channel is shown above these graphs so it is very easy to see if it is worth swapping to the other band. For rural use the 2.4 GHz band is likely to be fine, but it becomes more congested in urban areas thanks to all those 2.4 GHz gadgets and devices.

The Skycontroller also allows you to swap between bands if you wish.

Finally, if you get bored with floating the Bebop around and taking videos then

you can spice up your flying with some aerobatics. These take the form of pre-programmed flips, either left or right, or front and back. To engage this function simply tap the Flip icon on the top right of the Free Flight screen and choose the direction you want from the drop down menu. Then, with the drone in flight, just double tap the screen anywhere and the Bebop will flip over. It's a neat trick, especially when spectators are not expecting it!

### Conclusions

We have thoroughly enjoyed testing the Bebop drone. And flying it with the distinctive Skycontroller makes it all the more enjoyable thanks to its R/C style controls.

The video footage is clear and remarkably stable, even when taken during quite windy conditions when the drone is being buffeted by gusts. We were also impressed by the way that the horizon was kept level, even when the Bebop was leaning into the wind. And it is good to be able to use the camera joystick on the Skycontroller to finely tune the view from the camera whilst leaving the drone in a stable hover.

Still images are clear and we especially like the ability to record DNG files so we can tease out extra details from the much larger files.

Overall we have found the Bebop and Skycontroller combination to be fun and engaging to use. It's also much simpler to set up than some other camera drones we have tested, so you should be up and filming in no time – weather permitting!

**RCMW**



Close - up on the rear pair of anti vibration mounts. These spheres really work well to help stabilise the camera footage



Bebop sets off for another filming session

## MODEL WORLD DETAILS

### MODEL INFORMATION

<b>NAME:</b>	Bebop Drone with Skycontroller
<b>MANUFACTURER:</b>	Parrot S.A.
<b>DISTRIBUTOR:</b>	Flying Toys
<b>WEBSITE:</b>	<a href="http://www.flyingtoys.com">www.flyingtoys.com</a> (click the Parrot Bebop & Skycontroller link)
<b>PRICE:</b>	Bebop Drone (inc. 2 batteries) £429.99 SRP Bebop Drone & Skycontroller (inc. 3 batteries) £769.99 SRP
<b>MODEL TYPE:</b>	Quadcopter

<b>PARTS SUPPLIED:</b>	Airframe, 3 x 1200 mAh LiPo packs and charger, hull protectors, spare props and prop tool, Micro USB lead, Skycontroller, neck strap, mini tablet adapter, sunshade
<b>PARTS REQUIRED:</b>	Smart device – phone or tablet

### PRODUCT SPECIFICATIONS

<b>CONNECTIVITY:</b>	WiFi 802.11 a/b/g/n/ac
<b>CAMERA:</b>	CMOS 14 Mpx, 1/2.3"
<b>BATTERY:</b>	Lithium Polymer 1200 mAh
<b>PROCESSOR:</b>	CPU, Dual-Core
<b>SENSORS:</b>	3-axis
<b>GEO-LOCATION:</b>	GNSS
<b>DIMENSIONS:</b>	28 x 32 x 3.6 cm
<b>WEIGHT:</b>	380 g – 400 g
<b>COMPATIBILITY:</b>	iOS, Android



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RCMW13/03/14



CONNECT



# AN ITCH TO SCRATCH

*In the fourth part of his series on scratch building, Bill Bowne shows how to make your initial plan drawing look pretty*



*Look familiar? The Sassy is a simple sport design, drawn up just as we've been discussing.*



*Another model following the same design process was the Altair 400. Note that the landing gear rakes back so that the axles are under the wing, making the Altair 400 a pussycat on the ground*

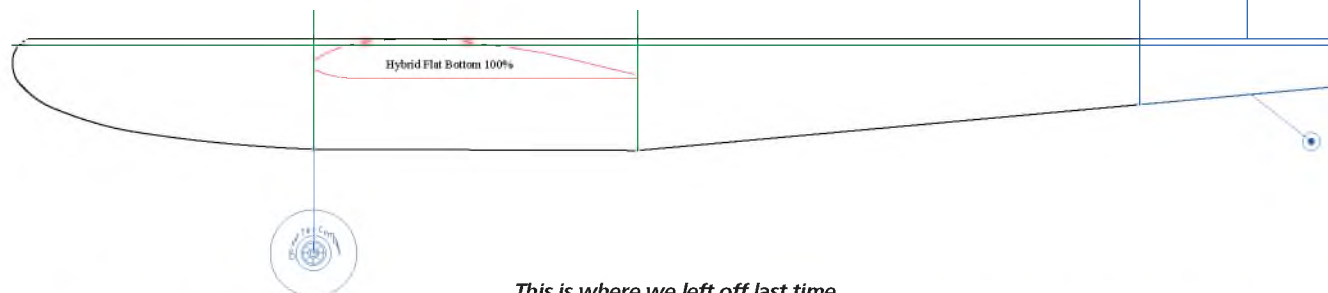


**W**hen last we talked, we were looking at a model that looked like the first drawing.

Rectangular wings work okay. But whilst rectangular tail feathers also work, they really look pretty crude. So how can we make a simple 'Plain Jane' model look sharp?

Let's start by modifying the vertical stabiliser and rudder. Our objective is to make a more pleasing tail shape whilst keeping the same tail area and the same aspect ratio (usually 3:1 span to average chord). If we decrease the chord at the tip then we either have to increase the chord

at the root, or else make the span longer. But we don't want the tail surface span to be too long or else it will flex. That is bad!

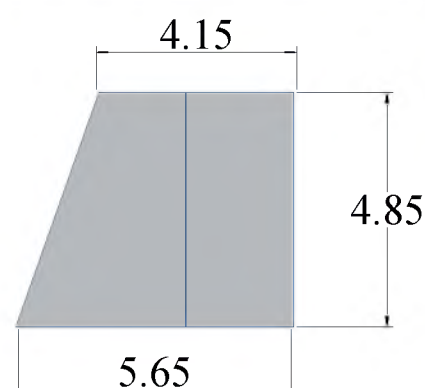
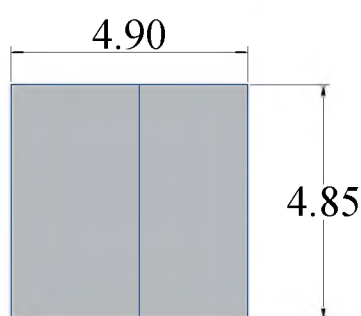


*This is where we left off last time*

### Tail Design

So, we make the vertical stab and rudder a bit prettier by moving the leading edge at the top of the stab back 3/4 inch whilst also adding 3/4 inch at the bottom. The area is the same because we haven't changed the stab's height or average chord.

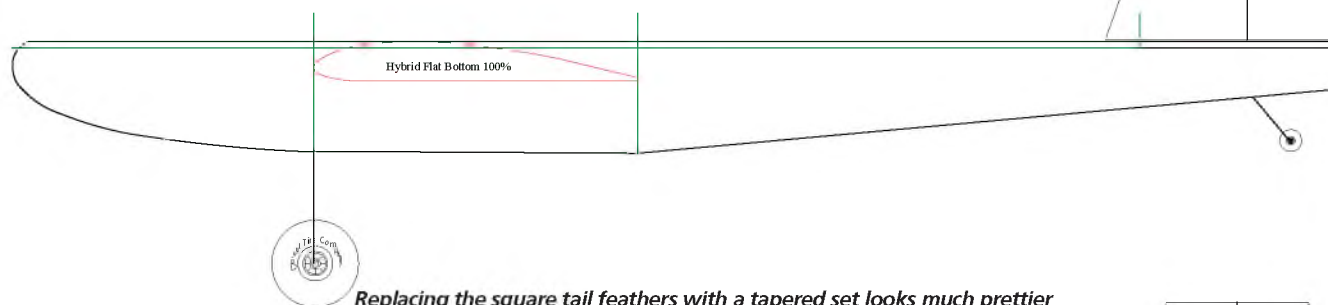
Once we've redrawn the vertical stab and rudder we'll do the same for the horizontal stab and elevator. Preferably, we'll add the extra chord to the front of the stab, but there's no problem if you average it or even add it to the rear of the surfaces. It just plain looks better added to the front (or averaged) anyway.



*Two tail fins, both of the same area, but the second looks much more attractive*

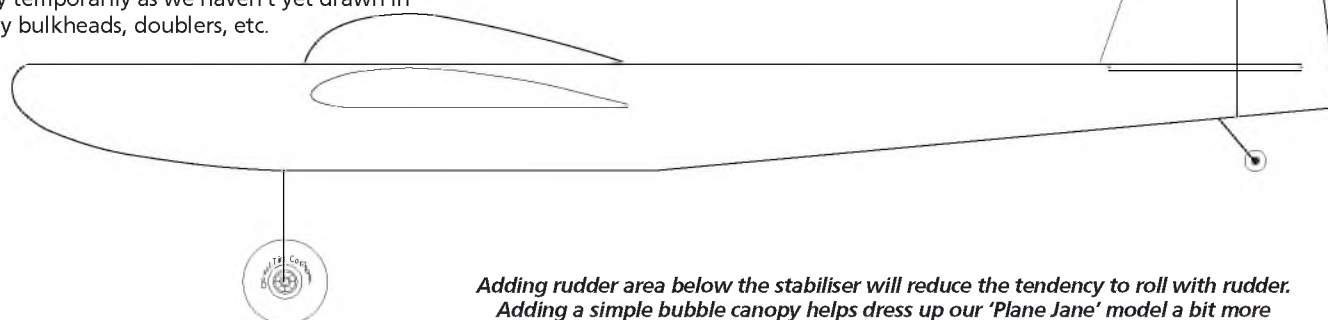
One aerodynamic 'fault' of having a rudder on top of the fuselage is that it will cause a rolling motion when deflected. (If you recall, we talked about this in Part 1 of this series.) To reduce the rolling tendency

we'll move part of the rudder area under the horizontal tailplane. And to make it even more effective we'll sweep the rudder trailing edge forwards a bit on the top (which means increasing the bottom rudder chord).



*Replacing the square tail feathers with a tapered set looks much prettier*

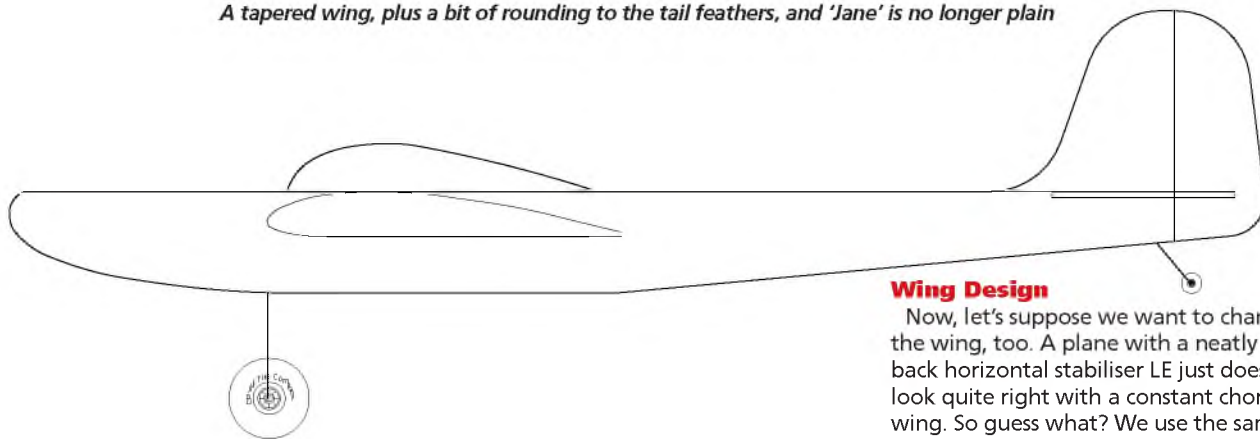
Finally, we'll add a bubble canopy and (temporarily!) remove the reference lines. I say temporarily as we haven't yet drawn in any bulkheads, doublers, etc.



*Adding rudder area below the stabiliser will reduce the tendency to roll with rudder. Adding a simple bubble canopy helps dress up our 'Plane Jane' model a bit more*



A tapered wing, plus a bit of rounding to the tail feathers, and 'Jane' is no longer plain



### Wing Design

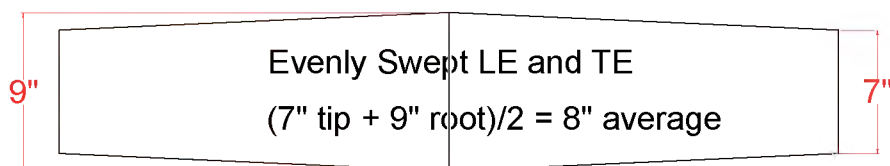
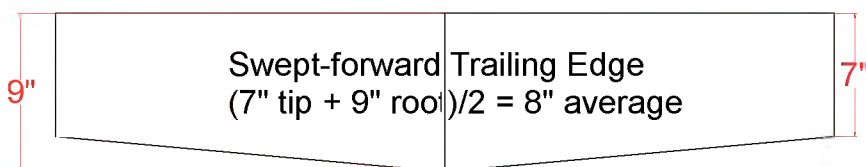
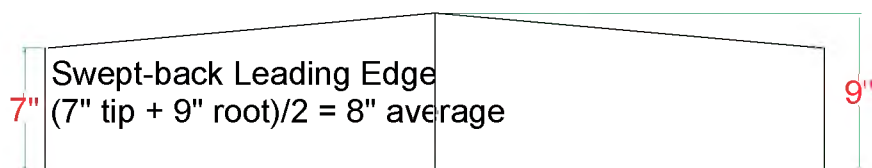
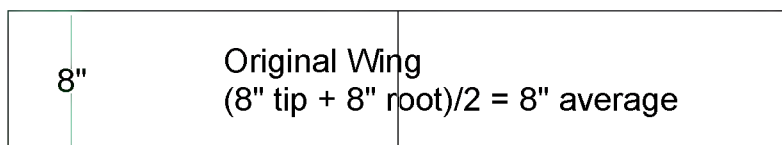
Now, let's suppose we want to change the wing, too. A plane with a neatly swept back horizontal stabiliser LE just doesn't look quite right with a constant chord wing. So guess what? We use the same method to taper the wing!

The wing drawing shows the original constant chord wing, plus three ways that we can easily change the wing's layout and still keep the same average chord. My personal preference is the second layout, putting all of the sweep in the leading edge and keeping the trailing edge straight. A swept leading edge helps lengthen the nose moment (reducing the likelihood of tail heaviness) and it adds a bit of a dihedral effect that works when both upright and inverted (to peek ahead a bit!).

So, we've added to the root chord and removed the same amount from the tip chord. Looks pretty nice, eh? Of course, when we add that two-inch bigger root chord to the drawing it means having to redraw the fuselage profile to fit it. I warned you we'd be doing a lot of erasing! Also, we now have to remember that the root chord is NOT the chord at the side of the fuselage. If I only had a dime for every time I forgot and drew the wing cutout to fit the ROOT chord, not the fuselage side chord...

Okay, so we've nailed down the outside shape we want for that new sport monoplane. What about biplanes, though? Stay tuned as we'll get into that next time!

**RCMW**



We can add a bit to the wing root, provided we remove the same amount from the tip, yet still come out with the same area. Each version has its pluses and minuses though

The Hot Dawg, showing my failure to match the wing and tail outlines. Whilst the plane flew great and was Micki's favorite for several years, it just didn't look right



One thing we're not going to cover in this series is what size wood etc. to use in a given project. Why? Because two models can have the same wing area etc. but be intended for two totally different 'mission profiles'. That is, both may sport 500 square inch wings but one may be intended as a lightly loaded trainer and the other as an all out racer. Obviously, each would require different internal structures due to the different stresses they have to undergo.



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# GADGETS & GEAR

James Crozier casts an eye on the latest batch of R/C products passing through the RCMW editorial office on their way for review

## Accu RC Simulator

There's no substitute for the real thing, but the myriad of obstacles that can sometimes stop you from getting to the flying field (inclement weather being the primary culprit!) means that it's always useful to have a simulator installed on your computer.

The big leap in terms of advancement in relatively recent years has been the advent of photorealism in simulators. However, the Accu RC Simulator for Windows steps this up a notch by introducing real world physics, aerodynamically correct model behaviour, as well as a virtual workbench that allows you to swap out components such as servos, blades, motors etc. This allows you to customise the model to behave more like your real world model.

Unfortunately, with these sorts of advanced features comes the inevitable issue of hardware requirements. While most modern computers made within the last year or so will be able to run the Accu RC Simulator, you'll need a fairly substantial gaming PC to get the best out of it. Accu RC recommends at least an Intel i5 or AMD FX8350 processor, 4GB RAM and an NVIDIA GTX 660 or Radeon R9 270 graphics card. <http://www.accurc.com/>



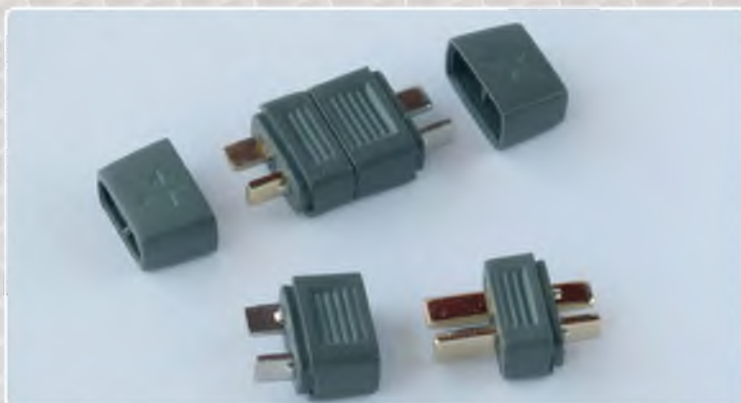
## Hobbico Star Plugs

The newest option in polarised power plugs is the Star Plug, a non-slip, no heat shrink solution from Hobbico.

Each Star Plug is moulded from a high strength, heat and impact resistant polymer and features gold plated male terminals for high conductivity as well as nickel-plated female terminals. Hobbico claim that they have a long life and are more wear resistant. The rear caps also include a central isolator that prevents the terminals from shorting out.

The stainless steel spring means that the connection should remain tight after hundreds of uses and the plug itself is easy to grip and pull apart due to the tapered shape and the moulded in grip strips.

<http://www.rcstarplug.com/>





## Muc Off

While not intended solely for aeromodelling, the Muc Off range of cleaners, lubricants and sprays, now being distributed by CML, still have many uses for our hobby. For example, the Fast Action Bike Cleaner can be used to clean engine exhaust oil residue from aeroplanes, as well as bugs and any other mess that has accumulated after a day's flying.

Back in the workshop, the Nano Grit Hand Gel Cleaner is useful for getting rid of any muck, grease or grime. And it is anti-bacterial too, as well as being paraben free (paraben's are widely used as preservatives in cosmetics). Muc Off have made their cleaner as chemically free as possible.

Finally, the C3 Wet Ceramic Lube has many modelling applications, such as lubricating all those moving parts in model helicopters. It will also prove invaluable for freeing up things like stiff pushrods, where they exit nylon outers. Stick a tube in your flight box and you are sure to find many other uses for it too.

[http://www.cmldistribution.co.uk/quicksearch.php?q\\_search=muc-off](http://www.cmldistribution.co.uk/quicksearch.php?q_search=muc-off)



## Parrot Minidrones Charger and Battery

If you own a Rolling Spider or Jumping Sumo (two of Parrot's latest 'Minidrone' products) then you've probably come across the problem of having to wait for the battery to charge more than once already when all you want to do is play!

Fortunately, Parrot have listened to customer feedback and have released a pack containing a separate rechargeable 550 mAh LiPo battery and charger to go with it. The charger is connected via a mini USB cable (supplied), so you can charge one battery whilst the other is in use.

Our Minidrone Charger was supplied by Flying Toys Limited.

<http://www.flyingtoys.com/index.php?route=product/category&path=118>



## JR Axis Gyro

The Axis Gyro from JR is designed to provide extreme stability for R/C model aeroplanes regardless of a model's aerodynamics or how aggressively any manoeuvres are performed. JR claim that it does this without interfering with the feeling of natural flight, and this is achieved by giving a proportionate amount of heading lock depending on the stick positions of your transmitter. Since JR have long experience with heading hold gyros for helicopters, we are pretty confident that we will find this to be the case when the weather improves enough to properly test our sample.

There is also a damping mode, which helps reduce disturbances around the yaw, pitch and roll axes.

The Axis gyro is JR XBus and Futaba SBus compatible, and it supports multiple wing and tail types. A throttle output is included for simple six channel set-ups and it can be plugged into the Axis in-line for quick and easy set-ups if you are already a JR Xbus user.

The parameters of the Axis gyro can be set using any DMSS transmitter, or alternatively you can use the Axis Assistant PC software, which is free to download.

<http://www.macgregor.co.uk/jrpropo/jrc02560.htm>



## Revell Control

Revell Control have just sent in a collection of their latest R/C toys for us to take a look at:

### Hexatron FPV

The Hexatron FPV is a large ready to fly 'hexacopter' equipped with a camera and it comes bundled with a neat video transmitter.

This copter features presets for the fast set-up of three speed levels, ranging from beginner to professional. The six rotors are said to give great stability and the Hexatron makes good use of the powerful motors for flipping whenever you want to spice up your multirotor flying.

The built in camera is 720p, which means that you can record HD quality videos straight to an SD card using the built in SD slot and the video transmitter. The model also has 'oscillating gummies' for steady video capture; I think that this means that it has anti-vibration rubber mounts!

A transmitter is included, and it comes with a clip-on high-resolution display. It can be switched between stick modes 1 and 2.

The Hexatron is supplied with a 7.4 V 1500 mAh LiPo, which is charged using the plug-

in balancing charger supplied in the box. It takes roughly 90 minutes to charge and has a flight time of around 5-7 minutes. However, the Deans style connector and balance lead mean that a fast charger could be used to speed up the charging process.



### X-Spy

X-Spy is a palm-sized, ready to fly 4-channel 2.4 GHz quadcopter that can stream live video footage straight to your smartphone. The transmitter comes with an easy to use, spring-loaded smartphone holder. X-Spy is supplied complete with a 3.7 V 700 mAh LiPo battery and a USB charger.

This little quadcopter is suitable for both indoor and outdoor flying, provided there is minimal wind.

Revell Control say that it has a range of 50 metres.



### Mini Boat

This ready to run R/C mini boat comes complete with a two-channel 40 MHz radio system and is fitted with a 2.4 V 80 mAh Li-ion rechargeable battery. The electronics are waterproofed and the boat's battery can be charged up in less than ten minutes. The mini boat will run for around 8 to 10 minutes on a single charge and has a range of around 6 metres. It's perfect for using on a small body of water, such as a garden fishpond. That's where ours is headed, anyway!

Revell Control models are available from [www.amazon.co.uk](http://www.amazon.co.uk) and all good toy and model retailers. For details visit: <http://www.revell-control.de/>







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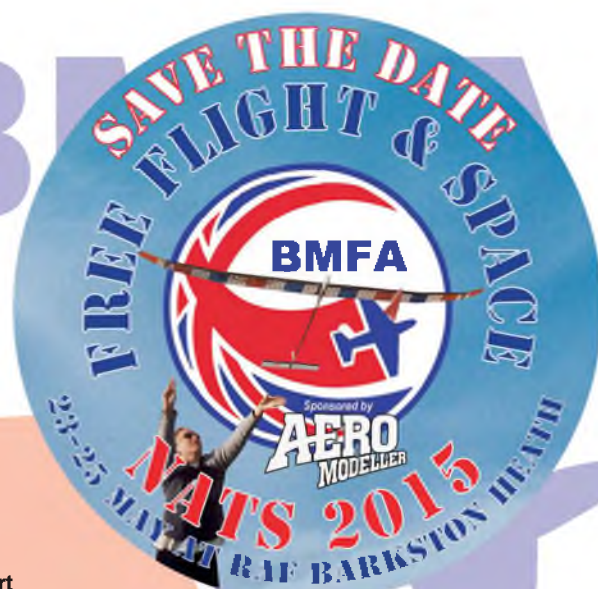
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# JR R/C GLOVES

*Ward off those late spring frosts with a pair of these fingerless gloves tailor-made for R/C modelling*

Last month we reviewed the excellent MacVet sports gloves and we came to the conclusion that they could only be bettered if they had fold back tips so that there was no material between the thumbs and fingers that we use to operate our transmitters.

By coincidence we then received notice of some new R/C gloves from JR Propo, one of the leading manufacturers of modern R/C equipment. Besides being an excellent way to promote the JR brand these gloves have been specifically designed for operating R/C transmitters. As such they have no material over the ends of the thumb, index and middle fingers, which are the digits that most pilots use to hold their sticks and to operate switches. We had to give a pair a try...

## Sizing Up

JR R/C Gloves are available in Medium, Large, XL and XXL sizes. We ordered the XL's as it is quite common to find that Japanese size clothing is a bit on the small size compared to UK sizes. And it's a good job we did as when they arrived they were, as suspected, a good fit for what we would call average size hands.

At the time of ordering we were unaware that JR's UK distributor, MacGregor Industries, had placed a handy (sic) R/C Glove Size Indicator on their website (<http://macgregor.co.uk/jrpropo/jrc08822.htm>), which you can use to work out the best size for your hands. So there's really no excuse for not getting the right size for your own mitts.

Made from Polyester and Chloroprene at the rear to retain warmth, and with Polyurethane material used for the palms to provide a good level of grip, these gloves have proven to be very comfortable to wear. They are secured using a hook and loop strap over the back of the hand; we have since found it best not to tighten this too tightly as these gloves are also elasticated at the wrist and doing so can restrict movement. A looser fit is much more comfortable.

As you would expect from JR these gloves are nicely made, with a stitched cuff neatly finishing off the ends of the fingerless digits. They are supplied in a plastic zip up pouch, which would be worth retaining to keep them safe and clean.

During testing they have the distinction of being the only gloves that the editor has kept on during an entire flying session – even when drinking his coffee! – which says a lot for their comfort and ability to retain just the right level of heat. And best of all it's great to be able to really feel the sticks whilst the rest of your hands stay warm and dry.

**RCMW**



*Just the ticket! A comfortable glove with exposed digits to retain the feel of the sticks and switches*



*The gloves are secured using a broad hook & loop strap*



*High grip palms ensure that you keep a good grip on the transmitter*



## MODEL WORLD DETAILS

### MODEL INFORMATION

**NAME:** JR Propo RC Glove  
**MANUFACTURER:** JR Propo  
**DISTRIBUTOR:** MacGregor Industries Ltd  
**WEBSITE:** <http://macgregor.co.uk/jrpropo/jrc08822.htm>  
**PRICE:** £24.95 SRP  
**MATERIALS USED:** Back – Polyester & Chloroprene  
 Palm – Polyurethane

### DISLIKES

- Would like to see a long cuff version for flying in deep winter

### LIKES

- Comfortable to wear for long periods
- Unimpaired feel of the sticks and switches when flying





*One of my favourite models is the petrol powered Vario R22. Easy to operate and relaxing to fly*

# ROTARY WINGS

**Despite the popularity of electric power, both petrol and glow engines are still widely used as power plants for R/C helicopters. Richard Morris has a few pointers for keeping them running**

**L**ast time I took a look at the Blade 180 CFX, which is a very capable small ready-to-fly 3-D helicopter that has become a firm favourite of mine, finding its way into the car almost every time I go flying. Along with this model, another firm favourite is the Goblin 570, which I took a look at a few months ago. Both of these models are electric powered so, by way of a change I thought it might be a good idea to take a look at some models

powered by internal combustion engines. It might seem to many that nearly everything today is electric powered but there are still a number of internal combustion engine powered models available.

Personally, I tend to favour petrol-powered helicopters, as much for their convenience as anything else. To go flying with a petrol model all you require is your model, transmitter and your fuel can (with pump) containing your petrol oil two-

stroke mixture. As a safety precaution it is always a good idea to have a small fire extinguisher in the car with you, just in case!

With a petrol model you can enjoy a complete day of flying for the minimum of expense, although the initial investment is usually higher than with the equivalent glow powered model. You will usually find that a petrol model is both larger and heavier than a glow equivalent and, quite



*T-Rex 600 powered by a .50 glow engine is a convenient size of machine*





*Keeping it simple by using battery powered glow sticks is fine for pod and boom models*



*A switchable glow system is more likely to be used in a scale mode*



*I use an Align starter, like this, with an integral battery and find that it can cope with most engines*



*A typical glow engine installation, with the mixture adjustment easy to get at*



*As can be seen, a petrol engine is usually much larger and heavier*

often, will tend to be the basis of a scale model. Although a number of people have been quite successful at performing some 3-D manoeuvres with them this not really what they are intended for.

Moving on to glow powered models, there are a great variety of machines available to you, from small ones that use .30-size engines to those using .90 to .105-size engines. As with everything the larger the model, generally, the larger the price tag. In the majority of cases a novice would start on a .30 to .50-size model, possibly moving on later to a .90-size model.

As with all forms of radio control these days there are lots of 'Almost Ready To Fly' packages available, with almost all that you require in one box. The only additional equipment that you would still need to purchase is likely to be some starting equipment.

To start the glow model you will require an electric starter, along with a device to energise the glow plug. This can be as simple as a battery operated glow stick, up to a state of the art adjustable glow driver operating from a 12 volt battery. I would tend to favour keeping things as simple as possible and would use a simple glow stick, although in some models it is more convenient to use an on-board glow device.

I always avoid running the glow plug from the same battery as my electric starter, as the electric starter can draw a large amount of power when turning over a large motor and this will tend to reduce the efficiency of the glow, so making the motor almost impossible to start.

A number of people are put off operating a glow engine because they have heard horror stories about how difficult they can be to start and set up. But in fact they are no more difficult than any other helicopter, whether it is glow, petrol or, for that matter, electric.

Each has their own peculiarities and once you become familiar with your particular machine then any problems should disappear. I have found, over the years, that there are two main reasons why a glow engine will not start and these are either

that the glow plug is not supplying a hot enough glow to ignite the fuel, or the fuel is not reaching the combustion chamber in sufficient quantity – if at all!

Obviously the first problem is easily remedied by ensuring that the power supply to your glow plug is sufficient and that the glow plug itself is in good condition. One sign that the glow plug is starting to degrade is, when the power is removed from the plug when the engine is running, if the engine revs decrease, or the engine stops, there is a good chance that the glow plug requires changing.

It never fails to amaze me that people will start to adjust the mixture settings on an engine that has been running fine before changing the glow plug. You must remember that the plug is a consumable item and will need to be changed at regular intervals.

If you find that you are starting to change the plug after almost every flight this is usually an indication that the engine is starting to produce small particles of metal from within and often indicates that the main bearings should be changed.

If you have changed the glow plug and still experience trouble running the engine then you need to look at the fuel. Before starting to adjust any fuel mixture settings, firstly check the fuel lines for damage or kinks that might restrict fuel flow. If you have a filter in the fuel line, then this should be cleaned or replaced. Filtering the fuel, after it has passed through the fuel pump and before it goes into the fuel tank is essential. And if done properly should remove the need to have a filter in the line to the engine.

If fuel flow is still a problem then remove the fuel tank and inspect the fuel line within the tank, which runs to the clunk. As a matter of course you should change this. I have known the fuel line in the tank to completely degrade over time, so changing it once a season might be a good idea.

When you are absolutely sure that fuel can flow to the engine unrestricted then the engine should start and run. But if there is still a problem then removing



*It is so important that the fuel in the tank is filtered properly*





*This glow model is certainly running a little on the rich side, hence the smoke*



*That's better! There's enough smoke to ensure the engine runs properly with no overheating*

the main needle from the carburettor is possibly the only course of action left open to you. Before removing the needle, screw it completely in, counting the number of turns, so you can return to approximately the same setting. With the needle removed you should be able to blow some fuel through the valve from your fuel pump, which, with any luck, will clear whatever is blocking the valve.

So, basically, whether you are using petrol or glow fuel, ensure that the fuel entering the tank of your helicopter has been filtered. You would not put dirty fuel into your car for fear of blocking things up, so treat your helicopter the same, but even more so, as the carburettor is much smaller, as are the jets within it.

That is just about all that I have time for this month. So until next time, fly safely.

**RCMW**



*Another petrol model, this time my Schweizer 300 using a 29 cc Zenoah engine*



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# THE FLEET

## AIR ARM MUSEUM

### A TREASURY OF NAVAL AVIATION

*Derek Small reports from the home of the International Radio Controlled Air Show, held at the Royal Navy Fleet Air Arm Museum in Somerset, and discovers a gold mine of scale information*



**Sopwith Pup.** A replica of the first British aircraft to take-off and land on an aircraft carrier

**A**s it is now established as a regular part of the show scene in the South West of England, the bi-annual Yeovilton model show stimulated me into making a few comments about the museum itself. At one level it could be described as 'small but beautifully marked' but there's more to it than that, as you will read later.

For those of you who need to worry about convincing the family that you (and they) should go, I hope to show you a little of what will attract the modellers, and also what it will mean for the family.

#### **A Great Day Out**

As a visual history of British Naval Aviation the museum makes a great day out. It manages to cater for children and make it interesting for those who are not so obsessed by the nerdy stuff that we modellers crave for. I am continually – and

pleasantly – surprised by how many of the things that are relevant to my hobby are also a source of great enjoyment to others.

I was welcomed to the Museum by Debbie Howarth, the Communications and Events Manager. She told me something of the history and the future plans of the museum, and showed me around.

I witnessed a couple of young mothers taking their toddlers around, and was surprised at the level of involvement showed by the whole group. There are a considerable number of experiential exhibits, including a room dedicated to the basics of aerodynamics, and a group of school children, who were being led by their teacher, were certainly gaining a great deal from it. Just in case you are thinking that this isn't of much concern to us as aeromodellers, these children might well be the future of our hobby when the bulk of us grey haired old 'uns shuffle off of this

mortal coil. Some of our clubs' teaching methodologies could learn a lot from the simple and graphic way that shows how aeroplanes work.

#### **Interactive Exhibits**

For those less fascinated by aerodynamics, such items as the award winning 'Carrier Experience' takes you on a journey to an active carrier flight deck. The sound and fury of the place where some of the great British aeronautical designs of the fifties and sixties were used is quite an audio assault (in a good way). With the kids, you can take a simulated helicopter ride out onto a carrier flight deck, where videos of aircraft taking - off and landing, plus a heap of naval heavy metal surround you. You then get to walk through a myriad of passageways in the lower decks before returning for a bird's eye view of the deck area.





*Short Biplane. This would certainly take some modelling*



*Supermarine Walrus. Many a downed pilot would have been glad to see this venerable old lady*



*The Fairey Flycatcher holds the visitors' attention in Hall 1*



*Westland helicopters. With the factory just down the road this collection is no surprise*

Also in this hangar, the simulator makes for an exciting ride and throws you about in a most convincing manner. Be warned – it is a bit of a wild ride! All in all these are great ways of grabbing the attention and exciting the young ones. And, who knows, encouraging them to become the modellers, engineers, designers and pilots of the future.

Most of these folks probably wouldn't understand the fascination we modellers have in the minutiae of detail available to us on this site, or what a great day out it makes for modellers. The real joy of this place for us lies in the static aircraft on exhibit. If you want to really understand what in the antiques world is known as 'patina', or what a warbird really looks like after it has seen action in a critical war zone, then all you need to do is get up close and personal to some of the aircraft.

Several other exhibits really caught my eye; some because they are of aircraft I have a particular affection for and some because of their rarity and historical significance. By the way, you will not get a sanitised view of some of these aircraft. Hall 2 is where this is particularly noticeable. They certainly don't all look as if they are straight out of the factory. The Navy has taken great pains to restore some of the planes to their original colour schemes, and that's not by repainting them, but stripping them back to the original finish, and that can take you by surprise.

As an example, the Grumman Wildcat is in a colour scheme that I have never seen in my many years of modelling. However, it is correct and it has taken much painstaking work to remove the layers of over painting to get it back to the way it looked when it

was being used in earnest. The unusually coloured Wildcat is left looking rather battered and careworn, but as the livery for a model it would make a great alternative from the dark blue American examples so commonly seen.

Many museums have renovated their stock, and they now look like new. But that leaves you with a false perception of what they would have looked like in service. However, a good look at some of the exhibits in Yeovilton can really show you how to make a scale model look like the real thing when they earned their living by doing what they were designed to do.

The Corsair is a very popular warbird on the modelling show scene, but I have never seen one that looked anything like as well 'used' as the one in the museum. It is so battered that you might almost think

#### Four Halls

The museum consists of four themed Halls. Hall 1, just after the entrance, is where you will currently find the oldest of the aircraft on display. These include a replica of the first British aircraft to take-off and land on an aircraft carrier, the rather beautiful (and popular from the modeller's point of view) Sopwith Pup. Together with the Short Biplane, the Supermarine Walrus and Fairey Flycatcher, you can track the change from wood and doped linen to metal construction, and from open structures to enclosed cockpits.

Nearby, rotary wing enthusiasts can see evidence of the way helicopters, as used by the Royal Navy, have developed. This exhibit will be updated very soon, apparently with some Royal connections!



*Chance Vought Corsair. With the Sea Fury and the MiG 15 in the background, this beat up looking Corsair shows what wear and tear really looks like!*





*An unusual colour scheme for the Grumman Wildcat*



*How about this for potential scale detail? The original factory number is still visible*

of it as a basket case. But, of course, after the war so many were scrapped, and those that were not sent to the breaker's yard seemed to have been rebuilt and found their way into the racing scene in such places as Reno, USA, but with a sanitised and highly polished new look. But the Royal Navy's example has been taken back to the original finish, to the extent that the original production number as painted on the cowling is visible through the paint, just as when it was first applied at the factory.

#### Post War

The Supermarine Seafire, Fairey Firefly and Hawker Sea Fury look rather more immaculate. They epitomise for me what was going on in naval aviation at the end of the war, and in the years just after. There is something quite refreshing about the colour schemes of that period that again makes a welcome change from the Royal Air Force's greys and greens. There is something very 'clean' looking about the Fleet Air Arm colours on these 'last of the piston-engined' breed, just before they were displaced by a wide range of jets.

With the MiG-15 suspended from the ceiling nearby, a key piece of aviation history is encapsulated. This MiG is an example of the only communist jet fighter to be shot down by a British propeller driven fighter in the Korean War. Here you can see the museum's example, hanging just above its nemesis, as flown by Peter 'Hoagy' Carmichael. The Sea Fury was, of course, designed by Hawker's team, led by Sir Sydney Camm.

This museum certainly makes you marvel at the staggering rate of technological development, so clearly demonstrated by the lineage of the Sopwith Pup in the nearby hangar, through the Sea Fury to the Hunter, and then the Sea Harrier. It is almost unbelievable to think that this progress occurred in a mere fifty or so years! How amazing must it have been for those that lived through this period of time?

It's also fascinating to reflect on the difference in the political climate that led to the UK supplying the technological know-how that enabled the Russian aerospace industry to produce the MiG, a remarkably successful Russian jet fighter that became master of the skies over Korea until the North American F86 Sabre entered the battle.



*Was there ever a more graceful profile?*



*This MiG 15 is an example of the only communist jet fighter to be shot down by a British propeller driven fighter in the Korean War*



### Look Up!

As you wander around it is also important to check out what is above you, since you'll see an old 'Stringbag' (Fairey Swordfish) and a Bristol Scout suspended from the roof. I have to say that the Swordfish really brought it home to me how courageous those aircrew must have been, carrying out their attacks in an aircraft that looked more appropriate for the previous war and which travelled at a similar speed to those Great War Scouts. Apparently one of the redeeming features of the Swordfish was that since it was so slow the enemy gunners allowed too much deflection and often ended up shooting ahead of their target!

### Cold War Warriors

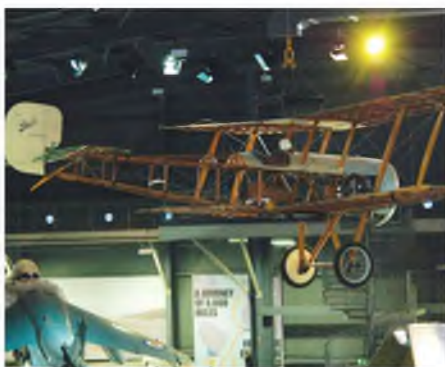
I have always loved the sheer variety of approaches and innovations that the British aerospace companies came up with at that time. We were truly up there with the best in the world. You only have to look at the jets on show in Hall 3 – the 'Carrier Experience', including the mighty Sea Vixen, the Scimitar and the Buccaneer. Back in the '60s these were all making their mark as Cold War warriors. The fact that the Buccaneer was still making that mark, both figuratively and literally (laser targeting) in the Iraq conflagration tells us so much about the sheer amount of talent that British aerospace designers had, and the effectiveness of their designs. This display of warbirds with such amazing hitting power reminded me just what the idea of exercising power at a distance really meant. Wouldn't it be great to see more examples of these prototypes flying around the model shows, as a change from all of the expensive upmarket ARTF American aircraft types to which we are so often exposed?

### Concorde

The British Aerospace heritage is also represented in Hall 4, which is dominated by the iconic shape of Concorde 002. The HP 115 and the Fairey Delta 11 are very special aircraft and ones that would be fantastic to see at the model shows. Come on you jet and EDF modellers! In fact, Debbie tells me that this hangar, as well as being historically significant, is quite a favourite with businesses for running their



*Fairey Swordfish, affectionately known as the Stringbag*



*The Bristol Scout is exhibited in Hall 1, which is where you will find the oldest aircraft on display*



*Another view of the Sopwith Pup*

corporate events and quite a few folks have had their business meetings in the shadow of Concorde 002. Some even use it for far more romantic events!

### Other Exhibits

While these Halls hold the bulk of the interest for the scale modeller, scattered liberally around the walkways, and viewing areas are a great host of pieces of memorabilia and models. Some indicate the future development of naval aviation, with models of the aircraft carrier force of the future. You can also learn about the Merlin helicopter and its uses.

Other displays give us information about all of the less obvious support services. We see just how much effort is needed to make such a museum thrive and grow, with examples being the reclamation work that enthusiasts do in recovering old aircraft such as the Blackburn Skua and the rebuilding of the Fairey Barracuda.

So, all in all, these four hangars, together with a few exhibits outside, are a treasure-house for R/C modellers and are well worth a detour off the nearby motorway network. In fact, it's well worth the trip to the West Country for the whole day anyway! By the time you read this it is quite possible that news of future plans at the museum will have been released, some of which sound really exciting.



*Fairey Delta 2, which held the World Airspeed record (for a while)*

### The Cobham Hall

There is an even bigger treasure store of aircraft and memorabilia across the road in the Lottery funded Cobham Hall, but this is not generally open to the public at the present. Some of its many treasures are screaming out for attention, but if you keep your eyes open you might get the chance to see them. Let me explain...

Just once a year this particular treasure house is opened to the public and another seventy or so exhibits are available to be seen and drooled over. It makes you wonder just how good this fabulous little museum would be if given a bit more space to show off more of its stock?

I can do no more than encourage any of you who haven't visited to do so. And to anyone who already has, please do so again!

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# TOP TIPS

Here's a page of useful ideas from our readers

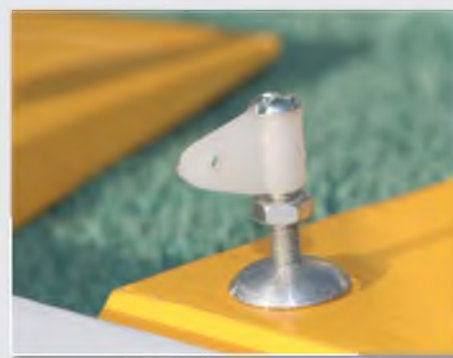
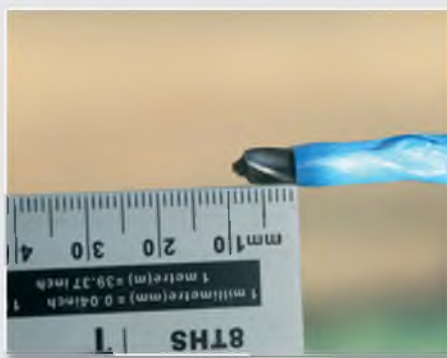
## Seagull Horns

Barry Atkinson may be the editor of our sister title, RC Jet International magazine, but he still reads RC Model World and he likes to fly conventional models at his local model club. Recently Barry was assembling an ARTF kit from Seagull Models, the Ka 8 glider, when he came up with this useful tip for installing Seagull's distinctive bolt style control horns. Barry says:

*"I needed to mark and drill 6 mm holes in the underside of the*

*elevators and ailerons to receive the Seagull control horns. The holes need to be 9 mm deep and you need to make sure they don't go all the way through the surfaces!*

*A good tip to help avoid this is to wrap some masking tape around the drill at the required 9 mm depth to guide you. Once done, epoxy in the cup type washers ready to receive the bolts and nylon horns."*



## Throttle Lock

Simon Cragg offers up this simple way of restraining the throttle stick prior to flying an electric model:

*"During the last couple of years I have constructed and flown several electric R/C models. I am well aware of all the safety considerations when using LiPo batteries and speed controllers etc. But I (and other club members) have found that even with the most stringent personal safety procedures it is still possible to inadvertently knock the throttle stick when the model is 'armed', resulting in the propeller starting to spin.*

*This can be caused by the throttle stick catching on clothing, a neck strap etc, especially when the model is being placed on or retrieved from the ground. Needless to say considerable damage could be done if this occurred. After considerable thought, I came up with the throttle restraining method, as per the attached photographs.*

*A 'sleeve' was made from a small section of Biro cap. A was hole drilled in the cap and attached to some thin white cord. This in turn had a knot tied in the end and trapped under the battery compartment access cover. All parts were then given two coats of bright orange paint.*

*I have tested this 'in anger' at our flying site and it works perfectly. The restrainer is left on at all times prior to actually starting the motor. The cap can then be slid off by the thumb operating the throttle stick (in Mode 2). Needless to say other types of radio transmitters will differ slightly but a suitable anchor point should be easily identified.*

*Anyway, even if this article saves one person from being injured I have achieved my aim."*





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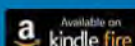
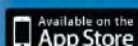


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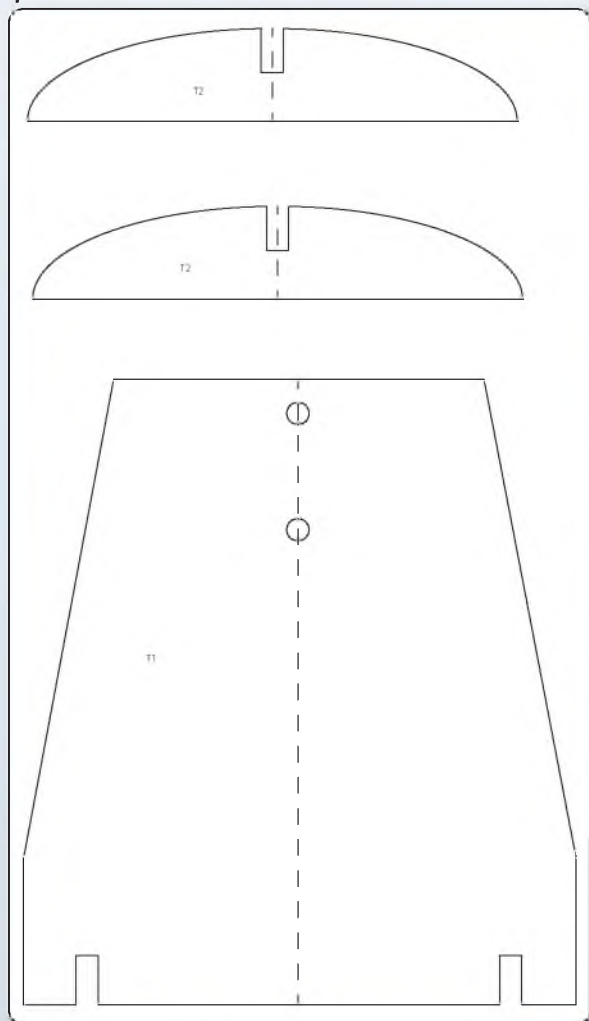


# CENTRE OF GRAVITY STAND

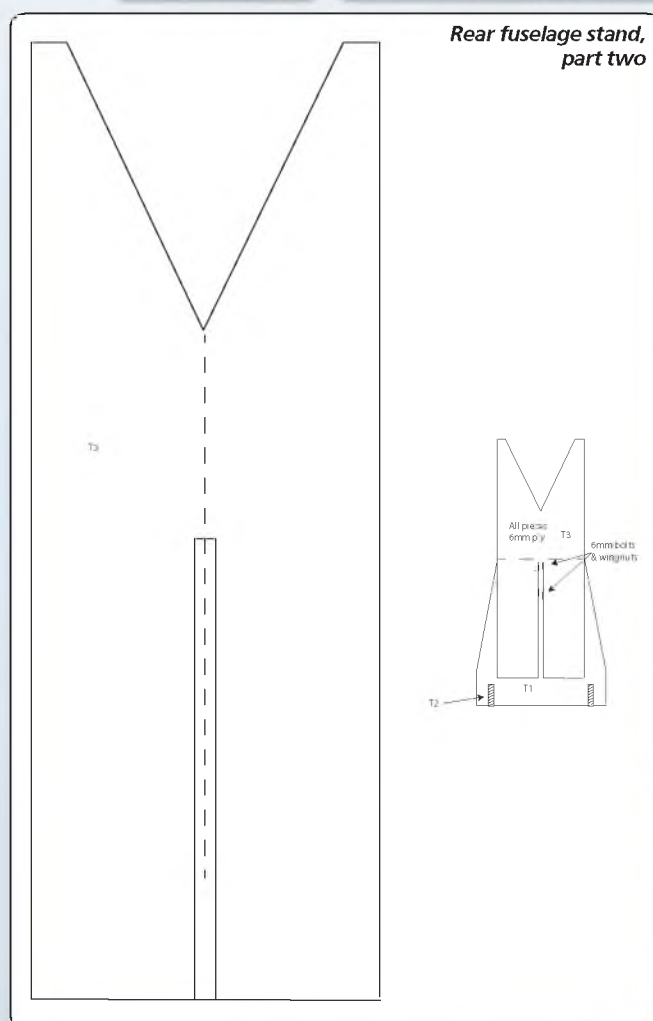
For those interested in Chris Williams' C of G stand, which he describes in this month's Silent Scale column, starting on page 22, here are all of Chris' drawings at a slightly larger scale



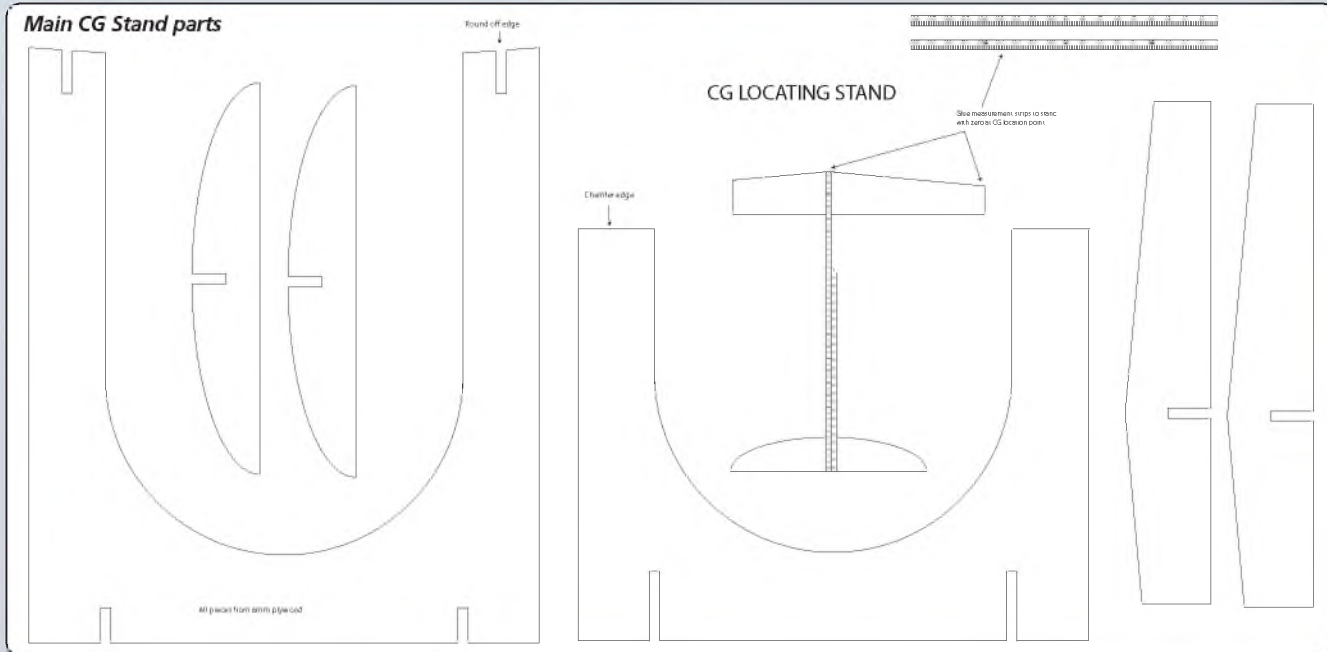
Rear fuselage stand,  
part one



Rear fuselage stand,  
part two



Main CG Stand parts





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Designed by D Womersley  
A super 1:4 scale model with beautiful lines has proved to be an excellent subject for scal, drawn on three large sheets.

Plane specifications	
WINGSPAN	75"
RADIO FUNCTIONS	4 FUNCTION + FLAPS
ENGINE	.60-.90 2-STROKE

**PLAN REF MW2001**  
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## FOKKER D.VII

Difficulty ★★☆☆



Designed by Gordon Whitehead  
A 1:7 scale model that has delightful flying qualities and is stable and manoeuvrable. A very clever design and construction allows this model to be rigged or dismantled in double quick time.

Plane specifications	
WINGSPAN	53"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.40 - .45 ENGINE

**PLAN REF MW2031**  
**£20.99 / \$33.99 + P&P/S&H**

## SOPWITH CAMEL

Difficulty ★★☆☆



Designed by Dale Tattam  
Designed to 1:5 scale this larger version of the classic dogfighter features wing panels that detach from the centre section for transporting the model. Drawn on two large sheets.

Plane specifications	
WINGSPAN	66.5"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.90 4-STROKE

**PLAN REF MW2042**  
**£20.99 / \$33.99 + P&P/S&H**

## SUPERMARINE SPITEFUL

Difficulty ★★☆☆



Designed by Pete Nicholson  
A 1:8 near scale replica of the successor to the Spitfire, one of Britain's fastest piston-engined aircraft. This has been designed to include a retractable undercarriage.

Plane specifications	
WINGSPAN	52"
RADIO FUNCTIONS	4-5 FUNCTION
ENGINE	.40 2-STROKE

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## SUPERMARINE SPITFIRE F22/24

Difficulty ★★☆☆



Designed by Gordon Whitehead  
This classic 1:8 scale design shows working flaps and undercarriage detail, including the retracting tailwheel. It can also be built as a hand-launch PSS glider

Plane specifications	
WINGSPAN	56"
RADIO FUNCTIONS	4 - 6 FUNCTION
ENGINE	.40 2-STROKE

**PLAN REF MW2053**  
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## BABY GREAT LAKES

Difficulty ★★☆☆



Designed by Dave Womersley  
A fantastic 1:3 scale design, a beautifully finished plan complete to the smallest detail.

Plane specifications	
WINGSPAN	66"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.90 2-STROKE

**PLAN REF MW2100**  
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## DH TIGER MOTH

Difficulty ★★☆☆



This Tiger Moth is well suited to Sunday flying by the scale enthusiast.

Plane specifications	
WINGSPAN	57"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.40 - .61 2-STROKE

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## DH MOSQUITO

Difficulty ★★☆☆



Designed by W.S Fleming  
Developed as a bomber so fast that it didn't need defensive guns, the Mosquito was developed into several different versions. This version shows a B MK.IV with a clear nose and a gun equipped FB MK.VI Fighter Bomber.

Plane specifications	
WINGSPAN	63"
RADIO FUNCTIONS	4 FUNCTION + AUX
ENGINE	2 X .25 2-STROKE

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## SPITFIRE MK.IX

Difficulty ★★★★★



One of the most successful of all the Spitfire variants, the Mk.IX was conceived as a stop gap measure to use existing airframes and the new two-stage supercharger equipped Merlin engine. This version keeps construction methods simple and the model could be hand-launched with the undercarriage removed.

Plane specifications	
WINGSPAN	56"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.40 - .61 2-STROKE

PLAN REF MW2107  
**£15.99 / \$25.99 + P&P/S&H**

## DH71 TIGER MOTH

Difficulty ★★★★★



Designed by B. Price  
This design of the de Havilland Tiger Moth racer is ideal for the modeller working within restrictions, whether small field, small budget or small car.

Plane specifications	
WINGSPAN	50"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.40 2-STROKE

PLAN REF MW2164  
**£12.99 / \$20.99 + P&P/S&H**

## FOKKER DR.1 TRIPLANE

Difficulty ★★★★★



Designed by David Hurrell  
This scale model of the aircraft made famous by Baron von Richtofen, is a delight to fly and surprisingly quick to build and rig.

Plane specifications	
WINGSPAN	47"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.40 2-STROKE / .45 - .50 4-STROKE

PLAN REF MW2187  
**£15.99/\$25.99 + P&P/S&H**

## MILES M.33 MONITOR

Difficulty ★★★★★



Designed by Tony Nijhuis  
This plan makes a good introduction to twin-engined flying with its easy engine access and straightforward construction methods. Retracting undercarriage installation is shown and the relatively experience flyer will have no problems.

Plane specifications	
WINGSPAN	56"
RADIO FUNCTIONS	5 FUNCTION
ENGINE	2 X .15 2-STROKE

PLAN REF MW2612  
**£12.99 / \$20.99 + P&P/S&H**

## MINI SPITFIRE

Difficulty ★★★★★



Designed by Keith Humber  
Spitfire designed for full-house control and the experienced builder and flyer.

Plane specifications	
WINGSPAN	42"
RADIO FUNCTIONS	3-4 FUNCTION
ENGINE	.19 - .29 2-STROKE

PLAN REF MW2677  
**£11.99 / \$19.99 + P&P/S&H**

## HAWKER TYPHOON

Difficulty ★★★★★



Designed by Pavel Bosak  
Go tank busting with this all built-up model by well know scale designer Pavel Bosak. Simple but accurate construction results in a superb replica of the RAFs heavy fighter.

Plane specifications	
WINGSPAN	48"
RADIO FUNCTIONS	4 FUNCTION
ENGINE	.30 - .45 2-STROKE

PLAN REF MW2684  
**£11.99 / \$19.99 + P&P/S&H**

## HAWKER SEA FURY FB11

Difficulty ★★★★★



Designed by Graham Hughes  
Another super scale model from Graham Hughes. His Sea Fury took 10 years to develop and the result was well worth the wait. A magnificent 1:7.2 scale model of the last piston-engined Naval fighter..

Plane specifications	
WINGSPAN	64"
RADIO FUNCTIONS	4 - 7 FUNCTION
ENGINE	1.00 - 1.50 4-STROKE

PLAN REF MW2788  
**£13.99 / \$22.99 + P&P/S&H**

## SPITFIRE IX

Difficulty ★★★★★



Designed by Giles Fowler  
The MH434 is famous for its public displays and has been scaled down to 1:12 to fit in the car without dismantling. This construction is traditional, and with a dolly or a hand-launch she flies so well.

Plane specifications	
WINGSPAN	36"
RADIO FUNCTIONS	4 FUNCTIONS
ENGINE	.10-15 2-STROKE

PLAN REF MW3201  
**£11.99 / \$19.99 + P&P/S&H**  
**LASERCUT WOODPACK WP3201**  
**£27.99 / \$47.99 + P&P/S&H**

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Please note a wood pack consists of the ribs and formers for the model. You will need to source additional strip wood and balsa from your local modelling materials supplier to complete the model. All prices are correct at time of going to press but may be subject to change without further notification. Prices do not include P&P/S&H. For more information on postage, please see [www.trapletshop.com](http://www.trapletshop.com).



Barry Vaught reports from the season opening Florida Jets event held in Lakeland, Florida

# FLORIDA JET-TOGETHER



Ali Machinchy's Airworld F-104, built by Trond Hammersted. 1/4 scale, 177", B300F Turbine. Best Military Jet and Critics Choice Award

**W**elcome to sunny Florida, USA and the start of the R/C model aeroplane show season with the Florida Jets 2015 Jet-Together. Four days of fun, thrills, camaraderie, food, and flying were had by all. Top Gun music was playing in the background and the Paradise Field runway was busy as usual.

There were more large jets this year than in the past. Pilot Ali Machinchy and builder Trond Hammersted are always exciting to be around and you never know what surprises they have in store. I was told about a secret shipment that was expected to arrive the first afternoon of the Jet-Together. Ali and Trond unpacked a large crate and assembled the largest jet to ever participate at Florida Jets. The custom 1/4 scale, 177 inch long Airworld Modellbau F-104 is breathtaking and the craftsmanship is astounding. This was the maiden flight

and the F-104 performed flawlessly. Ali's expert piloting is always a thrill and to have him piloting his new monster F-104 was a treat.

Trond Hammersted made the F-104 in his home town, Skein, Telemark, Norway. He started building aeroplanes as a child, and advanced to building jets about 10 years ago. His progression in building took a giant leap at the 2006 JetPower show in Germany when he got his first scale Airworld BAE Hawk jet. Trond has made 25 Airworld models for people worldwide. His scale craftsmanship is easily recognised and is neat, simple, functional, beautiful and works flawlessly.

It is always nice to meet families at the airshows and see them enjoying their time together. Robert and Amy Pannell travelled from cold, snowy Cincinnati, Ohio. Robert worked for a large air freight

company and wanted to make a jet like his company used. That idea did not work out so he designed and built a giant 1/18th scale UPS scheme DC-10. The DC-10 looks very scale in the air and you would think it was a full size UPS jet. Robert sets a good example for everyone, as he hands out a pre-printed spec sheet on the DC-10. This is a great example of how to showcase your aeroplanes. The photographers and writers will thank you. The scratch-built DC-10 is powered by twin Schubeler DS-94 HDT ducted fans, with two 12SP LiPo batteries. The DC-10 weighs 41 lb, is 124" long, 112" wide, and Robert uses a Futaba 14MZ radio with 12 channels and 24 servos. Robert is currently building a giant 747-400, 144" wingspan, 160" long, with four Schubeler HST 94 ducted fans. We can't wait to see it fly.



Paradise Field is on the south side of an actual airport, so there are full size aircraft activities happening constantly. A B-17 was practising take-offs and landings for pilot certification, and a twin-engine aeroplane had an emergency landing with a stuck throttle.

With R/C turbine jets each pilot is required to have the correct fire extinguisher by his side on the flight line at all times. They need to follow all safety rules and be prepared for any situation.

Jeff Stubbs and his wife stayed in their camper with two large BAE Hawks. He was preparing his Hawks early one morning while his wife was enjoying the air-conditioned camper. There is no engine hatch, so everything has to be accessed

from the front. Jeff has developed a method to access everything quickly.

Rcacf member, David Shulman brought a very sleek Diamond jet that was super fast and thrilled the fans with very low passes. The jet is made by adjets.com in France and David uses a Futaba radio.

The Yak 130 by Randy Clark was another crowd favourite and carried a full load of ordinance. It is a Jet Legend kit, highly modified with scale details including drop tanks, rockets, a cockpit lighting system and scale speed brakes.

The crosswinds were challenging at times. However, when Bob Fiorenze flew his F-14 he started smiling and has not quit smiling since. The F-14 was a three year build and converted from ducted fans to turbines

with 18 lb thrust each. Custom made parts include the 100 ounce fuel cells per side, the swing wing and the electronics. It is painted in Rustoleum Black gloss spray paint with no clear coat. The rivet detail is burnt in. Five airborne batteries are used, with two for the receiver, two for the turbine ECU, and a single LiPo to power the swing wing.

Congratulations to Frank Tiano and everyone involved for another exciting and memorable Florida Jets. Do not miss an opportunity to attend one of Frank's model aeroplane airshows; you will not be disappointed.

For more information, please contact [franktiano.com](http://franktiano.com).

**RCMW**



Robert Pannell's scratch-built DC-10. 1/18 scale, 124" long, 112" wingspan, 41 lb, two Schubeler DS-94 HDT ducted fans, Futaba 14MZ, scale outboard and inboard leading edge slats. Best Electric Jet Performance Award



David Shulman's Aviation Design Diamond. 97" wingspan, 132" long, 42 lb, KingTech 210 turbine, Futaba 18MZ radio with SBUS PowerBox cockpit. Special Recognition Award



Jeff Stubbs' Skygate BAE Hawk. 1/3.8 scale, 99" span, 58 lb, KingTech 210 Turbine, Spektrum 18



Pete Blade's Tomahawk 2.5 Futura lights up the sky with its custom flame paint scheme





Randy Clarks' Jet Legend Yak 130. 1/4 scale, 113" long, 95" wingspan, 58 lb, two Jet Central Cheethas, JR XBus DMSS 14XGE Radio. Special Recognition Award



Bob Fiorenze's Yellow Aircraft A/C F-14 (Black Bunny). Kit no longer available. Wingspan is 86" extended and 46" fully swept. 84" long, twin Jets Mund VT 80 Turbines, 34 lb. Uses 15 channels and 13 mixers. Well deserved Best Craftmanship Award



Above & below: Jack Diaz's Fouga. 1/4 scale, 89" span, 33 lb, KingTech turbine



Craig Gottschang's MIBO Gen3 A-10. 1/7 scale, 120" wingspan, 65 lb, twin JetCat P120SE turbines, JR10X radio with Weatronic 12-22R receiver. Craig was a full scale A-10 Air Force pilot in the late 1970s. The A-10 is scaled after one flown by Captain Kim Campbell (aka 'Killer Chick') in 2003 during operation Iraqi Freedom. Best Multi Jet Performance Award



Rei Gonzalez's all wood Vampire. Kerry Sterner kit, 1/4 scale, Jet Central Cheetah, DX 18 radio





Kriss Gunter's Rare F-22, with thrust vectoring KingTech 180 and LED afterburner, nav and HUD lights, working canopy, TamJets pipe, DX18



Peter Goldsmith's Skymaster F-9F Cougar during a 'dirty pass' for the crowd. The F-9F is powered by a JetCat P140 RX and weighs 39 lb. Most Outstanding Jet Flight Award



Chuck Storrie's turbine powered Airworld ASK 21 sailplane, flown by Ali Machinchy. 23 ft wingspan. Special Recognition Award



Richie Holt's BVM Budwiser Bandit making the crowd thirsty



Frank Tiano's Giant Telemaster Candy Machine delivering goodies to our future builders and pilots. Piloted by Sean Curry. Those lollipops sure look good!z



Anthony Jr. and Tony Sr. Greco's Honda Jet, scratch-built without plans from a photograph. Of plywood and balsa construction, 111" wingspan, 50 lb, twin jet Central Rabbits Power, DX18 radio and Spektrum servos. Best Civilian Jet Award



Bill Freeland's F-16. BVM, 96.5", 31 lb, KingTech 140





Jason Bower's F-16 Thunderbird. 1/6 scale, 78", 32 lb, K140 power



Jeb Jacobson's Fei Bo F-5, 1/6 scale, 63" span, JetCat Rhino power, Futaba radio



Scott Harris and his Skymaster F-104, 1.5 scale, 132" long, 53" wingspan, KingTech 180 turbine, Spektrum DX18 radio



Greg Arnett's BVM Cougar taking - off and leaving a nice heat signature. KingTech 140 power



Group photograph of the runway during the half time show





Inside the fuselage of Ali Machinchy's monster F-104. Trond Hammersted labelled the landing gear air release valve button as the 'toilet flush button', as a joke to Ali. It actually is a safety feature when working on the F-104



Above & below: Scott Harris' Skymaster Hawk. KingTech 170 turbine, DX18 radio. Model has logged over 500 flights



John Casey's Komet. 1/5 scale, 86", 23 lb, P-120 power, Futaba 12 radio



Bob Violett's Ultra Bandit was a common sight



One of the numerous colourful Vipers in attendance



Brett Blix's Krill Avantis. 83", Jet Central Rhino, Spektrum RX radio





*Above left & right: Barry Hou's F-16. BVM kit was piloted by Kriss Gunter. K180 power, DX-18*



*Jorge Escalona's L-39. 1/5 scale, 45 lb, JetCat 200 power. Critics Choice Runner-Up Award*



*Peter Harasiewicz's Audi Futura. 36 lb, Behotech 220. Best Sport Colour Scheme Award*



*Kim Foster's Tomahawk Futura. 2.5 m, 100", 40 lb, PowerBox cockpit, KingTech 210 power. Best Sport Jet Award*



*Michael Betances's Aurora. KingTech turbine, Spektrum DX18 radio*



*Ecuador's Emilio Bruzzone's Airworld F-100F. Builder, Trond Hammersted. 1.5 scale, 89" wingspan, 111" length, 57 lb, Behotec JB220 turbine*





Captain Lukey Martinez's 'Best In The West' Shockwave



Anthony Greco Jr. and Tony Greco Sr. with their Honda jet. The full size Honda jet engine was recently granted FAA approval



Robert and Amy Pannell with their DC-10 after the last flight of the Jet-Together



Chuck Storie performing a pre-flight check on his turbine Sailplane



Jeff Stubbs and his BAE Hawk enjoying the Florida weather

### Florida Jets 2015 Special Awards

Award	Sponsor	Model	Winner's Name
Best Military Jet, Runner-up	Zap Glue	F-86	Vernon Montgomery
Best Military Jet	Model Airplane News	F-104	Ali Machinchy
Best Sport Jet, Runner-up	Global Jet Club	Bandit	Tim Redelman
Best Sport Jet	Horizon Hobby	Futura	Kim Foster
Best Sport Colour Scheme	JetCat USA	Futura	Pete Harasiewicz
Best Civilian Jet	CARF Models USA	Honda	Anthony Greco
Best Sport Jet Performance	Dreamworks RC	Shockwave	Franco DiMauro
Best Sport Jet Performance, Runner-up	Ray & Robin's Hobbies	Rebel Pro	Pablo Fernandez
Best Scale Jet Performance	Elite Aerosports	F-16C	Dustin Buescher
Best Electric Jet Performance	Best in the West Jets	UPS DC-10	Robert Punnell
Best Multi Jet Performance	FLY RC Magazine	A-10	Craig Gottschang
Best Craftsmanship	Bob Violett Models	F-14	Bob Fiorenze
Most Outstanding Jet Flight	King Tech Turbines	Cougar	Peter Goldsmith
Special Recognition	RC Sport Flyer	Yak	Randy Clark
Special Recognition	Booma RC	Turbo-glider	Chuck Storie
Special Recognition	Spektrum Radio	Diamond	David Shulman
Special Recognition	EZ Balancer	Panther	Mark Shapiro
Special Recognition	Power-Box Systems	Cougar	Bob Curry
Special Recognition	Duralite Flight Systems	MiG-29	Bill Culberson
Special Recognition	Bavarian Demon	Ultra Bandit	Friedrich Mursch
Critic's Choice Runner-up	Frank Tiano Enterprises	L-39	Jorge Escalona
Critic's Choice	Zap Glue & MAN	F-104	Ali Machinchy



Pablo Fernandez demonstrating his expert flying skills with one of his many Shockwaves



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Traplet Publications Ltd. are unable to take responsibility for event cancellations.  
Check before you go.

## INDOOR

**19th Apr '15**

**BMFA Scale Indoor FF Nats.** Note New Venue – University of Wolverhampton Sports Centre, Gorway Road, Walsall, West Midlands WS1 3TA, 8 am to 6 pm. Open Rubber, Kit Scale, CO2/Electric, Peanut, Pistachio, Glider, Air Race, Mass Launch. Pre-entry only – contact organiser. Spectators welcome £6.00, under-18 yrs free entry. Contact: Andy Sephton (07872 625279, andrewjsephton@gmail.com)

**25th Apr, 30th May '15**

**Tonbridge Gassers and Rubber Fanciers,** Indoor Flying, 6.30 pm until 10 pm, at King's Rochester Sports Centre, 601 Maidstone Road, Rochester, Kent ME1 3QJ. Freeflight and also lightweight R/C timed flying sessions throughout the evening. Contact Steve on 0208 942 5000 or Eric on 01622 737814 before travelling to confirm.

**7th May, 4th Jun '15**

**Waltham Chase Aeromodellers** Indoor R/C Small Models Meetings. Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. 7 pm to 9.30 pm. £4 for fliers and £1 for spectators. Fliers will be required to show proof of insurance. All models will be weighed before flight, and judged on their suitability for the venue on the evening. Alan Wallington, Tel: 01489 895157 or www.wcaero.co.uk

**2nd May, 6th Jun, 4th Jul, 3rd Oct, 7th Nov, 5th Dec '15**

**Indoor Fun Flying** at Furze Field 2015. Furze Field Sports Centre, Mutton Lane, Potters Bar, Herts EN6 3BW. 6 pm until 10 pm. Flyers £8, spectators £2. Contact Mike Quille, Tel: 020 8500 3549 or Email: mp.quille@live.co.uk

**30/31st May, 27/28th Jun, 25/26th Jul, 30th Aug, 26/27th Sept, 17/18th Oct '15**

**BMFA F3B League Events** (plus Speed Comp & Nationals). For more information and entries to Clive Needham, 0161 2843143, Email: l.needham7@ntlworld.com

**10th Oct, 14th Nov, 12th Dec '15**

**North London MFC** Indoor Radio Control Meetings 2014. Furze Field Sports Centre, Potters Bar, Hertfordshire EN6 3BW. Saturdays, 6 pm to 10 pm. All up weight for fixed wing 225 g, 36" span and helicopters 400 g. BMFA insurance required. Flyers £9, spectators £2.50. Contact Peter Elliot, Tel: 01707 336982

## GENERAL

**18th/19th Apr '15**

**IMAC UK** Training Weekend, Langar Airfield, Nr Bingham, Notts. Contact Steve Plummer 07899 961934

**19th Apr '15**

**F3A.** BMFA 1st GBR Team Selection Event. Stansted MFC. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See gbrcaa.org forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Mark Pearce on 01279 505798 or mobile 07764 681116 for details

**25th/26th Apr, 30th/31st, 27th/28th, 26th/27th Sept**

**Waterplanes at Ullswater** (Windermere Model Waterplane Flyers), contacts: George Carpentar on 01524 782272 or gcarpentar@btinternet.com, Colin Smith 01524 762282. Proof of insurance essential

**2nd/3rd May '15**

**IMAC UK** Competition. Castle Kennedy Airfield, Nr Stranraer, Scotland. Contact Mal Green: mcgreen65@hotmail.com

**3rd May '15**

**F3A.** BMFA 2nd GBR Team Selection Event. Hurley. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Adrian Harrison on 07976 244004 for details

**3rd May, Jun 7th, Jul 5th, Aug 2nd, Sept 6th, Oct 4th, Nov 1st, Dec 6th '15**

**Wessex Soaring Association** monthly slope fly-in, first Sunday of each month wind-dependent. Non-powered gliders and e-soarers permitted, all welcome. Slopes located in south Wiltshire, east of Shaftesbury. Contact Pete Carpenter for details Email: pete.carpenter@yahoo.co.uk/, Tel: 07919 903742

**9th to 16th May '15**

**Flamborough 2014 Modelling Holiday,** at Thornwick Bay Holiday Centre, Flamborough. A weeklong residential pre-bookable event – only persons booked through the MAA and staying at Thornwick able to participate. Facilities provided for powered aircraft, electrics, gliders, indoor flying and helicopters. Caroline Scoles, Tel: 01472 322874, Email: carolinescoles@hotmail.co.uk or visit www.modelaviatorsassociation.co.uk

**10th May '15**

**The Balbedie Open/Scale Event,** hosted by the Balbedie Aeromodelling Club, Balbedie Farm Nr Kinglassie, Fife, KY5 0UE Scotland. Open Event all aircraft welcome. BAC's great BBQ and refreshments available, bring your friends and family. Toilets provided. Proof of insurance to fly please. Balbedie Aeromodelling Club, www.balbedie-aeromodelling-club.co.uk, contact club secretary Colin Morrison at

secretary@balbedie-aeromodelling-club.co.uk for more info

**10th May, Jun 14th, Jul 19th, Sep 20th, Dec 27th '15**

**Devon Glider Days,** at Little Haldon, on the B3192 adjacent to the Teignmouth Golf Course. Please note reserve days are set for a week after scheduled event, apart from the December date, which has a reserve date of 28th. For further info contact Joe Speirs on 01662 834014 or Stan Yeo 01626 332287

**16th/17th May '15**

**IMAC UK** Competition, Cashmoor, Nr Blandford Forum, Hants. Contact Mal Green: mcgreen65@hotmail.com

**16th/17th May '15**

**'Mayfly',** includes the Ron Moulton Memorial Day (Saturday), Ebenezer Bert Striegler Trophy & Ebenezer Mass Launch (Sunday), and SAM35, with various Control Line events throughout the weekend. Directions: Old Warden Airfield, Beds. SG18 9EP. BMFA 'B' certificate to fly on the R/C flightline at these events. All pilots are required to show proof of insurance and BMFA membership, which shows 'B' certification. Please carry these documents with you on the airfield, as you will not be allowed to fly without them. This is a requirement of the Shuttleworth management. All types of model are welcome at all events (maximum weight 10 kg). Contact: Ken and Sheila Sheppard; Email: modelair.oldwarden@gmail.com or phone 07799 132999

**17th May '15**

**Traplet Scale** event at the Pontefract and District Aeromodellers site (WF8 4QD). Event starts at 10 am. Flying schedule and further information can be obtained by contacting Peter Maw by email at: secretary@bickershawmfc.co.uk

**17th May '15**

**GBR/CAA F3A League** competition. North Berks RMAS. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, John Mattingly at mattingley.john@gmail.com for details

**23rd/24th May '15**

**F3A World Cup League Event.** Criterium International du Hainaut Grandrieu, Belgium. Please contact Ashley Hoyland on 0114 2873432 for details

**23rd/24th May '15**

**Shilton Vintage** event, for further details contact Nick Blackwell, Email: nick@nickblackwell.co.uk, Tel: 01285 657610

**30th/31st May '15**

**Hastings Model Flying Club Fly-In,** at Middle Bridge (A259) between Bexhill and Pevensey, E.Sussex. All types of aircraft welcome including turbines. Camping available from Monday 25th May. Charge to



non-HMFC members £25 includes unlimited flying, non campers £5. Trade enquiries welcome. Contact Les Eagle on 01634 327228 to book

### 30th/31st May '15

**IMAC UK Competition**, Tholthorpe, Nr York. Contact Mal Green: mcgreen65@hotmail.com

### 5th to 7th Jun '15

**UK F3A World Cup League Event**. Near Ashford, Kent. International entry. Visitors welcome. See [www.gbrcaa.org/](http://www.gbrcaa.org/) World Cup/ or contact Contest Director Matt Hoyland on 0773 9840498 or Ashley Hoyland on 0114 2873432 for more details

### 7th Jun '15

**North London MFC Scale Day**, Warren Lane, Baldock, Herts, SG7 6RR. Flying from 10am. BBQ and drinks available. All pilots need BMFA A certificate or LMA proficiency, those flying >7 kg models need BMFA B certificate or LMA proficiency. Proof of insurance required. No noisy models please. £5 pilots entry fee. Contact Maurice Northcott on 07866 105721 or Email: mail@mpnltd.fsnet.co.uk

### 13th/14th Jun '15

**PSSA Fly-In**, The Great Orme, Llandudno, meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members – proof of insurance required. Usual 'Fly for Fun' format. For more information contact Phil Cooke on 07772 224719 or email: webmaster@pssaonline.co.uk

### 14th Jun '15

**F3A**. BMFA 3rd GBR Team Selection Event. Ashbourne, Derbyshire. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See [gbrcaa.org](http://gbrcaa.org) forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors by prior arrangement, please contact Contest Director, Adrian Harrison on 07976 244004 for details

### 14th Jun '15

**BMFA Northern Area and Pontefract & District Aeromodellers** announce the Annual 'Free For All' Electric Fly-In at Pontefract Park. Entrance ONLY from junction 21 M62 head towards Ponte and look for white gates on right. BMFA members can fly any electric model in this grass field. Gates open 9.30 am, admission FREE! Boot sale, traders welcome. A PANDAS member will win the Club Electric trophy. Further details from John Thompson, 01924 515595 [johnty99ntlworld.com](mailto:johnty99ntlworld.com) or [www.pandasaero.co.uk](http://www.pandasaero.co.uk)

### 19th to 21st Jun '15

**The Balbedie Midsummer Extravaganza Open Event**, at Balbedie Aeromodelling Club, Balbedie Farm Nr Kinglassie, Fife, KY5 0UE Scotland. Open Event all aircraft welcome. BAC's great BBQ and refreshments available all day. Saturday

Night entertainment with live band and bar. Camping and caravan facilities available. Toilets provided. Bring your friends and family. Proof of Insurance to fly please. Balbedie Aeromodelling Club [www.balbedie-aeromodelling-club.co.uk](http://www.balbedie-aeromodelling-club.co.uk), contact club secretary Colin Morrison at [secretary@balbedie-aeromodelling-club.co.uk](mailto:secretary@balbedie-aeromodelling-club.co.uk) for more info

### 19th/21st Jun '15

**Weston Park International Model Air Show** organised by Wrekin MFC. Weston Park, Weston Under Lizard, M54 Junction 3 and 8 miles off M6 Junction 12. Full size display both days, Top pilots, on site camping, over 100 traders. Contact Steve Bishop, Tel: 01952 587298, Email: [stevenbishop@blueyonder.co.uk](mailto:stevenbishop@blueyonder.co.uk) or [www.westonparkmodelairshow.co.uk](http://www.westonparkmodelairshow.co.uk)

### 20th Jun '15

**IMAC UK Competition**, Fradley, Nr Lichfield, Staffs. Contact Mal Green: mcgreen65@hotmail.com

### 20th/21st Jun '15

**F3A World Cup League Event**, France. Please contact Ashley Hoyland on 0114 2873432 for details

### 20th/21st Jun '15

**The Sumners Ponds Model Show** based in Barns green, West Sussex, 10 am – 5 pm each day. Open-air show with display areas exhibiting boats, planes, heli's, trains, cars, kites and much more with have-a-go areas, bring and buy, traders, food and drink plus other activities including archery & air rifle shooting range. See [www.sumnersponds.co.uk](http://www.sumnersponds.co.uk) for more information and download an exhibitor or trader form for entry. Craft stalls and other refreshment vendors also welcome this year by application only. Entry Fee: Adults £7.00/Child & Concession £5.00. Further information from Kimberley Pratt, Events Coordinator, Tel: 01403 732539, [bookings@sumnersponds.co.uk](mailto:bookings@sumnersponds.co.uk) [www.sumnersponds.co.uk](http://www.sumnersponds.co.uk)

### 21st Jun '15

**West Yorkshire Aeromodellers Swap Meeting**, part of the Keighley & District Model Aircraft Club 24 hour Charity Challenge, 7.30 till 11.30, to book your spot and for more information please check out the event website [www.24hrcharitychallenge.co.uk](http://www.24hrcharitychallenge.co.uk)

### 27th/28th Jun '15

**Wings & Wheels Model Spectacular**, North Weald Airfield, Essex, CM16 6AR. With some of the best exhibits, models, pilots and trade presence to be found anywhere in the world, this is a show you cannot afford to miss. No price increases for 2015! [admin@wingsnwheels.net](mailto:admin@wingsnwheels.net) or Tel: 01242 604126

### 27th/28th Jun '15

**F3A World Cup League Event**, Netherlands. Please contact Ashley Hoyland on 0114 2873432 for details

### 27th/28th Jun '15

**IMAC UK Competition**, Nr Wrexham, North Wales. Contact Mal Green: mcgreen65@hotmail.com

### 4th Jul '15

**GBR/CAA F3A League** competition. Skelbrooke. All schedules. See [gbrcaa.org](http://gbrcaa.org) then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Bob Rowland on 07969 456441 for details

### 4th/5th Jul '15

**Woodsprings 2015**, the South West's biggest Model Airshow featuring an exciting programme of model aircraft with full model trade support. Held at Claverham Drove Airfield, Yatton. Just follow the signs J20 or J21 from M5. See website: [www.woodspringshow.co.uk](http://www.woodspringshow.co.uk) Email: [towarren@westgatesystems.net](mailto:towarren@westgatesystems.net) or phone: 07970 473717. For general enquiries Email: [spitfire@woodspringwings.co.uk](mailto:spitfire@woodspringwings.co.uk)

### 5th Jul '15

**North London MFC Glider Day**, Warren Lane, Baldock, Herts, SG7 6RR. Flying from 10 am. BBQ and drinks available. All pilots need BMFA A certificate or LMA proficiency. Proof of insurance required. No noisy models please. £5 pilots entry fee. Contact Maurice Northcott on 07866 105721 or Email: mail@mpnltd.fsnet.co.uk

### 11th/12th Jul '15

**IMAC UK Competition**, Rhyl, North Wales. Contact Mal Green: mcgreen65@hotmail.com

### 12th Jul '15

**F3A**. 4th BMFA GBR Team Selection Event. Oxford. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See [gbrcaa.org](http://gbrcaa.org) then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Peter Brett on 07795 061145 for details

### 12th Jul '15

**Wolves Scale Glider Fly-In**, Long Mynd, Church Stretton, start 9.30 am. £3.00 entry fee, proof of insurance cover required. More details, Mark H. Richards, 6, Saxon Road, Penkridge, Stafford, ST19 5EP. Tel: 01785 712445. Mobile 07921 210629. Email: [markhrichards@yahoo.co.uk](mailto:markhrichards@yahoo.co.uk)

### 19th Jul 15

**GBR/CAA F3A League** competition. Grimsby. All schedules. See [gbrcaa.org](http://gbrcaa.org) then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Peter Scoles on 01472 507039 for details





*Every inch a workhorse, the Pilatus is thoroughly functional and practical*

# A BRIT IN BRITTANY

*Dave Goodenough begins an occasional series of R/C related ponderings from his home in France, starting with a painted Pilatus paradigm*

I was shocked, stunned and most definitely surprised! For the very first time in all our years together, my wife Pat, after asking "What do you want for your birthday?", said yes to a replacement for my old and very dismantled Precedent T180.

I've had one in mind since my last viewing of 'Air America' – the Pilatus PC6 Porter. The final choice of size and finish was hers; I make no claim whatsoever to the choice of colour scheme. In fact I get a headache just looking at it, but it's growing on me! Since it's a readily available ARTF that I've not seen reviewed before, I thought you might fancy a look see at what the box has to offer and how it flew. But first...

## Perfect Porter

You could never describe the PC-6 as being pretty. Designed by a dysfunctional committee maybe, angular certainly, but

aesthetics mean nothing to this plane. From the start it was Swiss designed to be practical. Porter by name and nature.

First flown in 1959, I believe it may still be in production, which must be a bit of a record in itself. Later licensed in America by Hiller as the AU-23A and UV-20 its STOL abilities and load capacity have endeared it to 'bush' pilots and parachutists all over the world. It even holds the record for the highest fixed wing landing at 5,750 m in Nepal. In other difficult to reach areas like Papua it is often the plane of choice for accessing tight and difficult airstrips in the highlands. Porters continue to do sterling service all around the world, being the workhorse of choice for so many organisations operating 'out on the edge'.

The Austrian registered 3G-EL modelled here (yes, it really is scale) started life in 'drab' before being repainted in 'der Bunter Fredy' colours around 2000, and it

was still sporting the scheme in Slovenia during 2008.

## Squint In The Box

The model was bought from Modellbau Lindinger in Germany, originally distributed by Pichler, but manufactured by VQ Models in Vietnam. Being assembled by a Brit in France, I reckoned the box and its contents had travelled quite a bit and might have suffered as a consequence. Once the inner and outer cartons were opened a good delve and rummage session proved there was no damage and everything appeared to be in there. But, oh, those vivid colours!

The mostly diagrammatic instructions looked adequate initially, but drifted into 'take a stab at it' territory a couple of times. Par for the course on these cheaper ARTF models and no problem if you've had previous assembly/building experience. The small parts all looked 'fit for purpose',



*Kit and all the fittings. Virtually all good usable stuff in there*



*What yer see is what yer get. Bright, innit?*





**Make sure to get the centre section ply braces in the correct way up and epoxy them well**



**Epoxying the first wing half. Use tape to hold the bits together and a clamp to hold the trailing edges 'true'**

though a couple made me 'harrumph' when their turn came for fitting. I don't like the type of control horn supplied as I've previously found them to be brittle so I replaced them with better quality items.

The model assembly doesn't need blow-by-blow directions – the manual shows how – but certain points need detailing. The wing dihedral is shallow and you need to be vigilant about fitting the four plywood wing braces the correct way. Two are located by the wing/fuselage locating dowels but in my kit the dowels were undersize, being 6 mm instead of the 7 mm dia needed. The dowels were also of poor quality wood, so I replaced them with two ali tubes cut from a 7 mm arrow shaft. Before fitting the two wing halves to the centre section a pair of access holes need to be cut in the underside of the centre section for the aileron servo extension leads. Their positions are not marked but they need to be within the width of the fuselage.

I found it easiest to finish the aileron servo fitment, complete with extension leads and then use a draw wire passed through the centre section to pull through the extension lead – easier done than said. Since I used small metal geared digital servos I made a couple of filler surrounds to tidy the mount. At this point the instructions say to fit the wing strut anchors, but with no position marked I chose to leave these until later. I used 'Z' bends on the aileron pushrod, choosing not to use the supplied parts.

I fitted my old Saito .45 4-stroke engine in a 'sidewinder' position, simply for ease of operation. The instructions recommend a .52 but I'm not after whizzy aerobatics as this is intended to be a day to day 'hack' model. The fitting instructions also recommend a .46 2-stroke or an electric motor of 870 watts. The 'T' engine mounts supplied were perfect for the task and

are my favourite type to use. With no fuel tank supplied (strange that) I used a SLEC 'yellow' square tank, which is a perfect fit in the tank bay.

Whatever motor you use it will entail cutting the nice, lightweight fibreglass cowl. With this aircraft's distinctive narrow nose you have to be careful to get the fit 'tight and right'. I used the 'cardboard taped to the fuselage and trimmed to fit' method.

The undercarriage fits 'as per' and apart from a few tweaks to fit the sprung 'oleo' ends it went together better than expected. Although pre-drilled for the main torsion bar U/C legs the securing saddle clamp/screw positions were not accurately aligned and I re-drilled them to suit the installation.

The tail gear is a ticklish fit, being awkward but rigid when complete. Access for the securing screws is via the open tail end of the fuselage and a hatch in the fuselage underside. Although a clearance hole is made in the tail gear access hatch for the tailwheel leg, on my model it was misaligned so I simply slotted it for ease of fitting.

The tail feathers are almost a jig fit, using a tongue and slot arrangement to align both the fin and tailplane. After carefully trimming back the film from the gluing surfaces it's a simple job to smear epoxy on the prepared wood, push it together and then use weights to hold it down until cured. On my kit the finished job was dead square without needing any adjustments or trimming. Both rudder and elevator controls use pre-fitted tubes and clevis prepared pushrods, with linkage stoppers fitted to the servo arms – all good, ordinary stuff.

### Wing Struts

With the wing temporarily fitted, I inverted the plane on my workbench to fit the wing struts. Although the instructions show a general position for the anchors, using M3 threaded linkage stoppers, I could find no pre-prepared holes in either the fuselage or wing. Instead I aligned the struts in what appeared to be the correct positions and then drilled holes for the stoppers. Inside the fuselage I added a reinforcing lite-ply patch and fitted my own M3 'T' nuts. I believe that this is a more satisfactory mount than the 'drill a hole and glue it in' method shown in the manual. I had to use the 'glue it' method on the wing anchor and time will tell if it is satisfactory. I will keep a close eye on those particular items!

The rest of the 'build' was just adding the tailplane end plates, putting a few stickers on the plane and adjusting all the servos and pushrods to give the recommended throws, to give me a reasonable starting point for the first flight attempts.

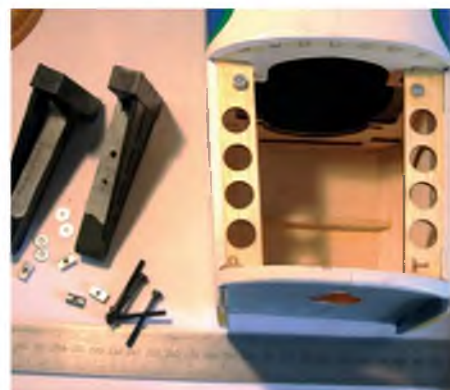
Surprisingly, and without any conscious thought about it, the C of G balanced perfectly on the rear end of the advised range. I prefer it that way as it 'enlivens' a model. The whole job thus far took around 15 leisurely hours, spread over two weeks. Time to adjourn to the piste, squirt fuel and quiver in anticipation.



**The mounting holes will take standard servos but I used minis and made fillers to tidy the servo surrounds**



**Linkage stoppers are used as strut anchors. I was doubtful, but they seem to work well**



**Preparing the engine 'T' mounts. Look at that distinct side thrust built into the firewall**



**Extra reinforcements were glued in behind the firewall. The original set up is minimal**



## On The Piste

My old Saito .45 has had a hard life. They are known to be 'tough as old boots' and virtually unbreakable. But I managed to break mine after having the wings 'clap' in an old model, whereupon the remainder plummeted earthwards, terminating in a small pocket driven into the tarmac runway surface! I bought a .45 'scraper' on eBay, married all the usable bits and, behold, I had an engine again. It remains utterly reliable, hence my reason for using it in the Porter. With my bench mounted model rest in place and all accoutrements strewn about it was time to 'man-up' and do the deed.

After range checks (you do range check, even with 2.4 GHz, don't you?), some fiddling with the motor and a couple of 'flame-out' false starts (traced to a too cool glow plug) I trundled the Porter out to the pilots' position on the runway. I revved to clear the engine, then throttled up and rolled forward for take-off. Off it went, with a slight swing to the right corrected with a tad of rudder, and took off straight as a die. But, oh my, did it climb! A bit of stick shoving to hold the climb to a sensible angle until at safe height was followed by some trim tapping to set a bit of 'down' into the elevator. This, plus a reduction of

throttle, saw the Pilatus flying hands-off. No aileron or rudder trim was necessary.

A bit of 'let's see what you can do' followed, checking out the control deflections, which seemed perfectly right for decent control of the model. Slowing up and gradually feeding in more up elevator eventually produced a stall, with a wing drop to the right on both attempts. It was nothing nasty and was easily flown out of after just a few metres drop and the application of power. I think the stall would have been much softer if I'd chosen to use the forward limit of the advised C of G.

## Time To Start Playing!

With power at around 75%, I started to wave the sticks around and explore the model's abilities – and able it most certainly is. Open the tap, twiddle the sticks and up into a fast chandelle. Well that was easy, as was a fast climb, throttle chop and over into a 'not quite' stall turn wingover. In fact repeated fast passes across a short strip of runway with stall turns at either end was a good game, as were several barrelly rolls. Some slow touch-and-go attempts proved good control at low speed and tested the sprung undercart.

It may be scale and look like a trainer but this model is fun! Quite honestly, I think the

slight lack of top end power, because I used a smaller than recommended motor, is no drawback as it makes the flight envelope much more scale-like.

Several flights later I had a slight whoopsie and 'arrived' rather than landed. I fly on a military site and we've recently suffered some unexplained interference on 2.4 GHz. Not possible, I hear you say. Well it is and we have several 'shot-down' models to prove it. In fact many more than mistakes and 'natural attrition' can explain.

The Porter was another victim and during the last flight of the day the controls 'froze' for several seconds before I regained control and executed an off-piste landing in the weeds. Unfortunately the landing took the last three feet of height, when only two feet were available! I cringed and wondered how bad would be the result, especially with a brand new model. Well, considering the puff of dust and shorn grass, it was not bad at all. A slightly tweaked U/C, a dislodged wingtip plastic moulding and a loosened wing strut mount (I did wonder about them) was all that occurred – no real damage at all. Two of my mates fared much worse and wrote models off. We are currently checking to see if high power military transmissions are the cause.



A SLEC yellow tank fits just right



There's lots of gluing surface for the tailplane and the fin jigs everything 'true'



Assembling the undercarriage



The tailwheel assembly is a fiddle to fit but is good and solid when done



It's a bit tight but the engine 'T' mounts do fit OK



Above & below: I used the 'cardboard and tape' method for trimming the cowl





*Ready to rumble and as pretty as a picture*



### Result?

It may be ARTF and I admit to being no lover of them normally but this is a cracking model! It flies like a dream, looks amazing and is more fun and much more able than I could have possibly imagined. I reckon it would be a super second model, once a new pilot has mastered three-axis control flight and developed their reflexes.

After the rough landing the simple repairs were completed in minutes –

proof of a tough airframe. I can't wait to get back out to the runway and play some more!

The real test is: would I buy another one? On the limited air time to date – yes, no question of it. This is one super model for general flying and I have no doubt that as I get to know it better I'll be putting it through more aerobatics. I know it'll manage with aplomb.

I love it!

**RCMW**

*The climb-out was fast and steep, and it got steeper before the elevator was trimmed!*



### CONTACTS

**Dave Goodenough**

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**First Flights**

[https://www.youtube.com/](https://www.youtube.com/watch?v=yC1R5s0SeP4&feature=youtu.be)

[watch?v=yC1R5s0SeP4&feature=youtu.be](https://www.youtube.com/watch?v=yC1R5s0SeP4&feature=youtu.be)

*Painted Pilatus Porter putters past perfectly*



*Dead stick! I played too long and drained the tank. No problem as it glides well*



*Off we go. Worried or concentrating – your choice. My mind was blank at this point!*



*Love it or loathe it, you can't ignore it!*



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# THE SPORT CHANNEL

*On Novices and Dandys. Gray celebrates the simpler side of R/C flying*

## This Month's Wise Words

To everyone who's enquired and offered their good wishes for my house moving mission, I'm more than happy to report that this edition of SC is the first to be completed in my new home.

Last month's was written during the chaos of the move, mostly whilst I was in temporary accommodation. This one though has taken shape amidst decorating, DIY, carpet fitting and unpacking and countless other forms of mayhem.

As yet, I've no idea how much space I'll have for modelling building here. But I did note that due to its slightly odd design, this is the first home in which I could lay out and make up a set of 50 ft control lines indoors! (Not sure the estate agents have yet identified this kind of feature as potentially desirable...)

I am able to sit here now and write this only due a small band of loyal friends. So, from this modest public platform, I would like to say thanks to Graham and Jane, to Juliet and to George for their invaluable help and hard work

It was during my own move that I discovered that Traplet Publications itself was in the process of relocating, so I guess it's a time of major change for everyone. From experience, I know that moving an entire workplace can be just as stressful as setting up a new home. My very best wishes to all at the new Traplet Towers!

**"HOME IS WHERE ONE  
STARTS FROM..."  
(T.S. ELIOT)**



*Pilots preparing for a mass launch of Cotswold Novices at Machrihanish airfield in Scotland. Sid King's perennial trainer/sportster is still going strong in events like this and there are sure to be more built from Sid's recent 'Novice E' plan*

## Novice News Flash

It was so good to see Sid King's 'Novice E' as last month's free plan feature. For those of us who've been fans of his original Cotswold Novice over the years, it's a real measure of a quality design (and the skill of its designer) that it should adapt so naturally to today's 'tech' and practice.

Novices taught many of my clubmates to fly and far beyond their role as basic trainers they all had long lives as well-loved sport models. In the past year a couple of very experienced competition and display pilots have revisited this timeless favourite.

From our items on the remarkably varied modelling interests of reader, Bryan Passey

from Lochgilphead in Scotland, you might not be too surprised to learn that he's a Novice fan – along with many local flyers, apparently.

Bryan writes: "I was chatting to Sid King this morning in regard to his updated Novice. He enquired if I had sent any photos of the mass flight of Novices that



*Bryan Passey and pals send up a swarm of eleven Novices at Machrihanish. Can you spot the biplane interloper?*



*Three contented Cotswold Novice pilots after a successful mass launch event. Want to join in with this year's fun? See text*



took place at Machrihanish at one of our Fly for Fun events. The end result was eleven, I think, but a biplane got in on the act and caused some confusion – all wonderful fun!

I might mention that our next Fly for Fun at Machrihanish is to be held on the 2nd and 3rd of May. The event caters for most disciplines including pulse jets. If there is a small corner where this information could be seen, I would be most grateful. Any further information can be obtained by phoning me on 01546 602918."

Consider it done, Bryan. I hope you'll get a good turnout and please let us have some pictures. Meanwhile, we would also like to see any Novice E's that are underway or even in the air. Incidentally, Sid's original Novice design is still available from Ben Buckle Kits.

### Another Absent Friend

Just as I'd submitted the feature last month by our friend Ian Peacock on the passing of TV presenter Bob Symes and Solarfilm creator Derek Hardman, Ian had more sad news to convey.



**Air Commodore Eric Baddeley who died earlier this year. Eric was a leading light in the RAF's own modelling organisation, the RAFMAA and is remembered in our feature by Ian Peacock. (Photo courtesy of Ginny Baddeley)**

I don't believe we've given much coverage here to the activities of the Royal Air Force Model Aircraft Association (RAFMAA) over the years, though since its formation in 1949 it has been one of the country's most active clubs, with branches at home and abroad. Ian wrote the following to pay tribute to one of its most distinguished figures:

"Air Commodore Eric Baddeley was perhaps not widely known to many of us. Eric (like Bob and Derek) was another engineer, with a far reaching career in the RAF. From an early start, he was a model aircraft fan and as far back as people can remember he was always involved with the RAF Model Aircraft Association.



**An atmospheric, old shot from the archives. Ian Peacock teaching Eric Baddeley's daughter to fly a trainer that she'd built. We remember this picture from one of Ian's airbrushing articles in (I think) the mid/late 70s. (Photo courtesy of Ginny Baddeley)**

As he progressed up the ladder in the RAF engineering branch his involvement in the RAFMAA broadened to the point where he became one of their longest serving and most prestigious presidents. Many and varied are the tales that can be told about

his exploits, both with models and the 'real thing'. (He was overall responsible for the maintenance programme for the Lightning fighters).

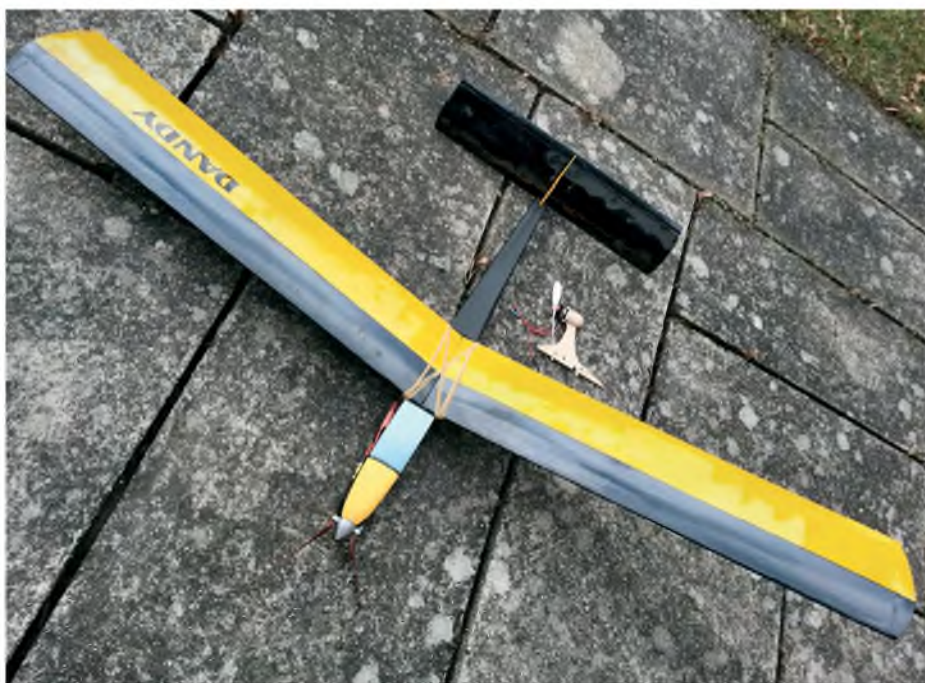
Anyone who ever attended an RAFMAA National Championship meeting whilst Eric held the reigns would agree that model flying took over the whole of the airfield. And it would have taken the outbreak of WW III to get him to shift the models away! Under his guidance the 'Honorary' membership scheme was instigated to allow demobbed personnel to return to the RAFMAA Nats, to compete alongside still serving members."

Eric Baddeley died on January 17th, aged 91.

Ian concludes, "I had the privilege of working alongside all three of these great people. Bob Symes, on TV, Derek Hardman, when my young daughter and I stayed with him and his wife Jean, whilst compiling the 'Solarfilm Story' for the model press, and Eric, with whom I worked at the RAFMAA Nats (and, at whose hand, I became the first, ever, 'civilian' Honorary member), not to mention having his daughter, Ginny stay over at my house, one summer long ago, where she built and flew her first ever R/C model aircraft.

All three of them had, in their individual ways, a great influence on the hobby and leave long-lasting legacies. They will be missed, by the families that they left behind, but remembered for things still going on today, in which they had a formulating hand."

Thanks, Ian. I hope that SC readers may send in their own reminiscences of any of these pioneering modellers and their work. Ian adds that Bob Symes' TV series 'Model World' and 'Model Magic', along with his various railway documentaries, are now available on DVD. If you missed them the first time around, do check them out (See 'Contacts').



**Gustav Rubitschka of Vienna puts a F/F twist on his Graupner 'Dandy' soarer. An extra servo tips up the tailplane to a 45° angle to give the dethermaliser effect. A gentler way to escape from strong lift without pulling the wings off!**



## Dandy D/T

Mail just in from our contributor from Vienna, Gustav Rubitschka, reminded me of a piece of aeromodelling technology that was never widely adopted but still conceived with great ingenuity – the Dethermaliser for R/C gliders...

In the early days of radio thermal soaring, when a large percentage of the lightweight 'floater' competition models would have been equipped with single channel radio, getting stuck in a monster, model-devouring thermal with no ready means of escape was a real possibility.

One solution explored at the time to bring them down safely was to equip these models with a free flight style tip-up tailplane dethermaliser (D/T) to bring the model gently down in a deep stall. This could be activated by a regular F/F mechanical timer, tripped by a 'quick-blip' auxiliary servo or, in the case of those new-fangled proportional sets, a quick stab of full stick movement.

## Wanna Whimsy?

With perfect timing for this tailpiece, I heard from my (until recently) near-neighbour, Dan Mellor. Dan is a master free flight builder and flyer, a former National Champ in the Kit Scale event, and is renowned for his immaculate construction, finishing and impeccable choice of subjects for both scale and sport flying.

Dan had just completed a rubber-powered biplane that I've long fancied due to its overwhelming cuteness and cheeky appearance. I was given a set of printed plans for the Whimsy nearly ten years ago,

I think that most of these D/T's were 'one shot' devices that could be deployed once per flight, with the model sinking to the ground, without the option of returning to normal flight attitude.

As models became more robust in design and had a wider speed range, getting down quickly (say, to achieve a spot landing within a time slot) was far less challenging.

Gustav writes: "This is my most recent try to build something out of the rut. It is a Graupner Dandy, which I built from a plan that was still in my possession and which I used to build several Dandys in the seventies.

I made her special by including a dethermaliser ('Thermikbremse' = Thermal Brake), by adding two tiny servos to the elevator. The D/T servo is under the wing. The weight of the servos made it necessary to use a 3S-3000 pack and to move the motor to the front. Now everything balances perfectly!

though I can't remember where they came from. I was so taken with its unusual lines that I made up a set of templates for its various curved, laminated components. But somehow this project got sidelined.

In subsequent years I've seen a couple of Whimsies flying indoors. And in both cases their performance matched their looks. Looking in my plan downloads folders recently, I discovered that I have a Zip file of the plans and article for the Whimsy. But I've no idea where it came from, as trying to backtrack to find a download site for it has been unsuccessful.

In the picture you see the originally planned electric power pod but with it there was no chance of reaching an acceptable C of G.

The moment I was almost finished with that plane, I saw another design in our mags, the Graupner Hi-Fly, with an all-flying elevator, thus making things much easier. I wonder whether I can achieve the desired 45 degrees D/T angle, which I enjoyed with one of my previous Dandys?"

Clever stuff, Gus. If I read the layout correctly the two servos in the tail operate the rudder/elevator functions, while the servo in the fuselage tips up the whole unit to the D/T angle. (Nice to see a name check for the Hi-Fly, too. A personal favourite from the 1970s in glider and electric versions).

Gus' revival of the R/C D/T also reminded me of a neat gadget that is possibly my favourite R/C modelling accessory. I'll dig it out for next time, I promise.

If anyone can enlighten me as to where it might have come from, please let me know. But as I have this plan, I would like to offer a free copy to any reader who cares to request it by email. As ever, if you should build one, some pictures would be gratefully received. It might be worth noting that no one seems to have yet scaled up this design for R/C – any takers?

Contributions, please, to The Sport Channel, c/o the Traplet Publications address.

All e-mail correspondence to: gray\_rcmag@hotmail.com

**RCMW**

Admit it, you want one of these already! Dan Mellor's 'Whimsy' rubber powered biplane is just irresistible. 17" span model has some arty curves, achieved with laminated outlines. A great performer in F/F, who's going to try a radio version? SC has free plans



## CONTACTS

**Ben Buckle Kits:** [www.benbucklevintage.com](http://www.benbucklevintage.com)  
**Bob Symes DVD's:** [www.sprucestudios.com](http://www.sprucestudios.com)



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**DUMAS** Nieuport 28 full kit, only started fuselage, the rest in box gave up on this one, and a Hobby King La Belle Dame for spare, but easily fix wings/fuselage/tails electronic, all ok but need canopy/spinner and the motor mount is loose but all working order. Swap for OS 15 or something interesting, or make me a offer thanks. 07986 730139, Northants.

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# NEXT ISSUE

### Floozy



Peter Miller designed this simple to build, small 37-inch span aerobatic biplane for .40 four – strokes or .32 two – strokes. He says: "Floozy was designed for several reasons. I wanted a biplane but I hate doing all the cabane struts and interplane struts. I also wanted a model that would go in the car in one piece – important in the winter. This model was a scale up of an earlier design, so I knew that it would work. The fuselage is completely new and the wings use a better wing section. One or two other improvements have been made to the construction and the control system. The engine chosen was an OS 40 FS Surpass. This provides plenty of power for all normal aerobatics."

### E-Bandit



E-Bandit, the latest design by Graham Dorschell, is a fast build, 35-inch wingspan, easy to fly model with crisp flying characteristics. It has the ease of construction and relative low cost of a foam build.

E-Bandit can fly very fast on larger KV motors, and on larger voltage and higher watt motors it can be made into a rocket! Even when flown at almost zero altitude it is very stable. The model makes use of a relative new idea of folding a Depron 5 mm flat foam covered vinyl sheet over itself using a 5 mm Depron spar.

## JUNE 2015 ISSUE ON SALE THURSDAY 21ST MAY

### Udvar-Hazy Collection



If you are a regular reader, fear not – you are not having a spell of déjà vu! We just wanted to let you know that we simply ran out of space in this issue and were unable to bring you Peter Kraus' article on the Smithsonian Air and Space Museum in Washington DC, USA. Just to remind you, the facility in Jefferson Drive, Washington DC, can hold only a small part of their collection. However a multi-million dollar grant from businessman Steven F Udvar-Hazy enabled the Smithsonian to build a building at Dulles Airport, which houses a lot more aeroplanes. Many of these rare aircraft would translate easily into scale models, making a change from commonly seen types. Following his recent visit, Peter points out subjects that he felt would be of greatest interest to scale modellers

## PLUS...

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All contents are subject to change without notice

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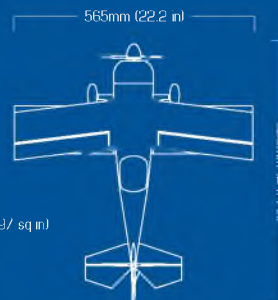
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Jacob Hollander pilots the full-scale  
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Photo provided by Alberto Pericoli

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**Ripmax**

# WOT4<sup>Mk2+</sup>

**FOAM-E**

BY **CHRIS FOSS**

**Updated  
Design**

SRP:  
**£134.99**

**Wingspan:** 1205mm (47.4")  
**Length:** 1050mm (41.33")  
**Weight:** 1100g (2.43 lbs)  
**Radio:** 4 - 5 Channel (Required)  
**Servos:** 4 x 9g Micro (Included)  
**Motor:** Brushless (Included)  
**ESC:** 40A Brushless (Included)  
**Battery:** 3S 2200mAh 30C (Required)

**Coming  
May 2015**

Chris Foss' ever popular Wot4 Foam-E Mk2 has been updated into the MK2+. The previous Wot4 Foam-E gained a reputation as the ultimate foam sports model and the Mk2+ builds on that. Like the previous version, the Mk2+ only requires minor assembly to get airborne.

The colour scheme has been changed from the previous blue, black and white scheme to a new modern 'easy to apply' scheme in the yellow, orange and red that are synonymous with Chris' classic designs. Buried inside the structure there are numerous changes to the internal design. The tailplane has been re-designed for improved styling with solid tips and inset elevators. The tailwheel has also been re-designed to be bolted on. If you want your Wot4 Foam-E to really stand out, then you can customise it using one of our option decal kits.

- Re-Designed Tailplane
- New Bright Colour Scheme
- Modified Internal Structure
- Option Decal Kits Available
- Removable Tail Wheel

## Optional Schemes



Z-CFD20/12B Wot4 Foam-E Mk2+ Decals Blue/Black

**£9.99**



Z-CFD20/12C Wot4 Foam-E Mk2+ Decals Yellow/Red/Black

**£9.99**

