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# RC MODEL WORLD



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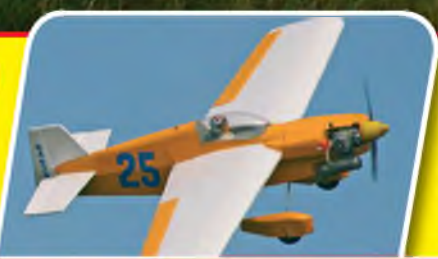
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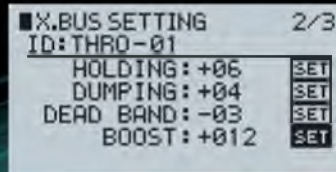
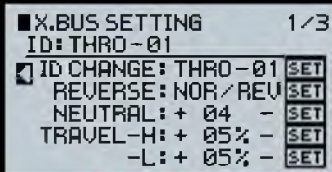
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RC  
**MODEL  
WORLD**

NOVEMBER 2015 • ISSUE #382



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# PRE-FLIGHT

**W**elcome to the November issue of RC Model World.

I had an interesting conversation with a couple of local modellers the other day who queried our coverage of multirotor models. In their opinion a quadcopter or similar multirotor machine is not a model aircraft, as it is not based on a full size machine, so why did we give them any coverage in RC Model World? My answer that multicopters, being radio controlled, were – love them or loathe them – a growing part of the R/C model aircraft scene did not cut much mustard. Nor did my argument that most of the major model manufacturers and distributors are investing heavily in multirotor offerings and that we should support the model trade with the products that they are developing.

If only I had been more awake I would have countered their main argument with the 'e-volo' man-carrying multicopter that we have featured before in Traplet magazines. And as for the model trade's interest in such machines, who understandably want to capture their own slice of the growing market for such devices, maybe a session with the Lark FPV from Udi R/C, which we reviewed in the last issue and is available via Ripmax, would have changed their minds as it encompasses the two new technologies that are leading the way in R/C development – First Person View flying, combined with a four motor multicopter.

Rest assured we don't intend to swamp you with multicopters – we have a dedicated magazine called Flight Camera Action for that – but we will continue to cover them as they are an established part of R/C model flying, as well as reporting on the exciting new technologies that they bring to our wonderful hobby.

But this month quadcopters take a back seat and get but a small mention in Dave Goodenough's 'A Brit In Brittany' column. We also welcome back the nation's favourite model show commentator, Dave Bishop for another recollection or two from way back when, plus a few more treats from our regular contributors.

A recent addition to our team is Donatas Pauzuolis, who contributes another fascinating article on indoor models – this time his subject is a half size Fokker triplane. Yes, you read that correctly! Grahame Wren's recent SE5a article went down a storm, so we asked him to follow up with another 'scale how to'; this time he concentrates on cockpit detailing. And Traplet's new editorial team member, Vaughn Entwistle recalls his first ever trip to the BMFA Nationals, with a little help from yours truly to introduce him to some of the UK's top model pilots.

More scale treats are in store courtesy of Peter Maw, who completes his build of the Traplet Fokker D8, as well as reporting from this year's Traplet Scale events. Finally, our features list is topped off by Gold Fever, our latest feature plan from Peter Miller's new series of glow powered semi-scale racing planes.

On review we have the rugged Master Stick from Hacker Model Production, plus we take a first look at an affordable 3-D printer that yields quite amazing results at a budget price. Making your own accessories is now a realistic proposition.

I hope you enjoy reading this month's issue of RC Model World. All that remains to do is to wish you...

Happy flying!

Kevin

# Kevin



## Kevin Crozier

Editor | Radio Control Model World

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## SPEED 400 EQUIVALENTS



Our Free Pull-out Plan this month is a reprint of Adrian Britton's original design that was featured in R/C Scale International magazine, November/December 2003, the accompanying article for which details the build of a Speed 400 powered Messerschmitt Bf 109E. Please turn to page 60 to read the full article.

Anyone who is a regular visitor to the huge range of model aircraft plans available on the Traplet Shop website (gb.trapletshop.com/aircraft-plans-parts), or who likes to flick through their personal copy of the Traplet Plans Handbook, will have noticed that we offer a large number of Speed 400 powered models. Many modellers still have usable examples of these popular brushed motors, together with matching ESC's and NiCad or NiMH battery packs, and this would be a great way to put these items back into the air.

But, of course, many modellers will also be interested in re-engining such S400 models

with something a little more up to date.

With this in mind we asked Dave Chinery, an electric flight enthusiast of long-standing and a regular contributor to this magazine, for his thoughts on a suitable brushless motor and LiPo combination to suit the Bf 109 and other similar models. Here's what Dave had to say:

"Hi Kevin,

*I could write a whole piece just on Speed 400 replacements but I will keep this as brief as possible. The biggest restriction on a straightforward conversion of the Me 109 is the dreaded words 'motor tube'! While this method of mounting was fine with the 400 size diameter motors, brushless in-runners the same physical size are typically much more powerful, maybe 400 watts compared to the typical 100 W of the 400. Not having the plan to hand, I can't see if the motor tube is an essential part of the fuselage structure but if it can be dispensed with there are lots of suitable motors.*

*I have researched motors from Hobbyking and Robotbirds, but the requirements are: Diameter not exceeding 28 mm, power output 120 – 150 watts, drawing 12 to 17 amps on a 5" or 6" diameter prop.*

*If no alternative mounting method is acceptable, by far the best motor I have found is the Turnigy 2627 1200 KV outrunner from Hobbyking, on a 2S or 3S 1100 mAh LiPo. At 26 mm diameter this motor could fit inside the standard motor tube and mount to a new plate fitted to the front-end of the tube. It would need to be carefully centred so the rotating case doesn't foul the tube and there may be cooling issues. Motor price is a very reasonable £9.98, and a more than adequate Hobbyking 30 A ESC with 3 A UBEC will add another £6.48.*

*The Robotbirds equivalent is their A2822 1800 KV motor (Item 409679), which at 28 mm diameter will require deletion of the motor tube. Price is £9.95 and goes with a 20 A Probasic ESC (Item 400264) at £7.80.*

*The motor/controller/LiPo combination is likely to be much lighter than the existing set-up so battery re-positioning/ballast may be necessary to maintain the correct C of G."*

Thank you for your suggestions, Dave. If you are considering upgrading your own Bf 109E to a brushless set up then please take heed of Dave's warnings about the extra power that is likely to be generated and beef up the motor mounting as necessary.

If you have already swapped a Speed 400 motor for a brushless motor in this or any other plane, please send us details so we can share your set-ups with other readers and maybe give a whole new lease of life to those old S400 models. And we would also like to hear about other size Speed can size conversions too!

## IN PRINT

**The Diary of a Hurricane Pilot in the Battle of France**  
Francis Blackadder of 607 Squadron

By Robert Dixon  
Fonthill Media, 158 pages  
978-1-78155-310-7  
£20 (£7.99 in Kindle format on Amazon)

I was looking forward to reading this book as it covers an area of the war I know relatively little about, the air battles over France in 1940. It's based on the personal diary of William Francis Blackadder, a pilot who fought through both France and in the Battle of Britain. It's effectively broken into three sections; the middle section is a reproduction of the diary itself and takes up 58 of the 158 pages in the book. The final section covers the period post France, which includes the Battle of Britain. It's in the first section that the author draws out the details from the diary into a narrative and also brings more sources in. The diary itself begins on 12th August 1939 but this goes

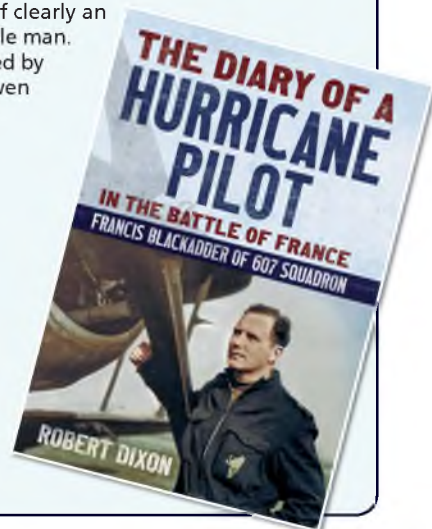
back to Blackadder's early life and joining the Auxiliary Air Force (AAF) in 1936.

I have mixed views about this book. I hadn't appreciated the difference between the AAF and other reserve squadrons. The coverage of his training was also surprisingly interesting and life as a part time pilot in the build up to war. It certainly does a good job in covering the flying career of a man who took part in the key air actions of the war, taught tactics and flew as a test and evaluation pilot too. I would have liked to know more about his post France flying.

My main criticism is in the proof reading. In taking a chronological account in a diary and turning it into a narrative, the author has jumped forwards in a few places to continue an event that takes place over a number of days. This does sometimes get a little confusing and I found myself having to go back and reread sections to check things. It also introduces a few mistakes, where a pilot is mentioned as killed but then reappears later. Another complaint is that, unsurprisingly, the strain and intensity of war left little time for keeping a diary. This does mean that nearly all the book covers the pre-war, training and 'phoney war' and goes a bit quiet when the fighting starts in earnest in 1940. It could have done with a little bit

around the aims of the British squadrons in France, their organisation and how they were deployed to put the actions into context. I would have liked to know the bigger picture they were a part of. A nice addition would have been an appendix with tables on the number of planes lost, enemy destroyed and a comparison to other squadrons. Also tables for Blackadder himself, the planes he flew, enemy destroyed to summarise the war career of clearly an incredible man.

Reviewed by  
Tim Bowen





# THE DRONECODE

Whilst doing some research on drone flying we came across the following useful information on the Civil Aviation Authority's website ([www.caa.co.uk](http://www.caa.co.uk)) and thought it was well worth passing on:

*"When you fly a drone in the UK it is your responsibility to be aware of the rules that are in place to keep everyone safe.*

*Follow these simple steps to make sure you are flying safely and legally:*

## The Dronecode

- *Make sure you can see your drone at all times and don't fly higher than 400 feet*
- *Always keep your drone away from aircraft, helicopters, airports and airfields*
- *Use your common sense and fly safely; you could be prosecuted if you don't*
- *Drones fitted with cameras must not be flown: within 50 metres of people, vehicles, buildings or structures, over congested areas or large gatherings such as concerts and sports events"*

See the CAA's quick-start safety guide on flying drones for fun and the First Person View video that explains the basic rules: [www.caa.co.uk/docs/1995/CAP%201202UAVsafetyrules.pdf](http://www.caa.co.uk/docs/1995/CAP%201202UAVsafetyrules.pdf)



## SE5A CORRECTION

Grahame Wren, author of the highly praised 'Great War Scout' article in the September issue, writes:

*"Hello Kevin,  
I thought you did a really good job of editing the article. The balance between photos and text was just right to keep up the interest. It's nice to know it was appreciated. There was only one error and that was the address for the scale model thread. I don't know if you do a 'corrections' section but if you do I've created a 'tiny url':  
<http://tinyurl.com/great-war-scout>  
This is a lot easier to type!"*



# MORE READERS' MODELS

One of the most enjoyable aspects of editing this magazine is to see the fruits of our readers' labours when they have completed a model that has been built from a Traplet plan. Here two more happy aeromodellers detail their latest model aeroplanes:

## G-HUGH (THE GOOD OLD WAY!)

Andrew Burston, one of our many readers in Australia, writes:

*"Dear Kevin,  
The moment I saw Roger Vaughan's G-HUGH in RCMW, January 2015, I knew I had to have one.*

*Being a 'balsa butcher' from way back, I used this medium because I am not used to Depron. In the event it turned out a little heavy at 9.3 oz, as it's a little over-engineered. However, I have great hopes for its flying ability."*

Thank you for showing us your 'balsa conversion' Andrew. Do let us know how she flies.

## BELL HOP

Nick Hughes of the Hampshire Electric Flyers has completed a free plan double:

*"Hi Kevin,  
I always enjoy the Free Plan feature, but I reckon your contributors must wonder how many are going to get built? Well here are two! The Bell Hop from January 2010 was built over the last two winters from the Traplet plan pack and flew brilliantly; two ounces over the target weight, but with 185 W power it goes very smartly, with as much vertical performance as you like.*

*The Mini Lec Roo from October 2014 was less keen to fly. Mine came out very heavy and is going to need a fair bit more power than it has at the moment to get away from a hand launch. Never mind, a bit of experimentation and we'll get there!*

*Only problem now is what to choose next."*

Many thanks for letting us see your models, Nick. We hope that you've sorted the delta now!



**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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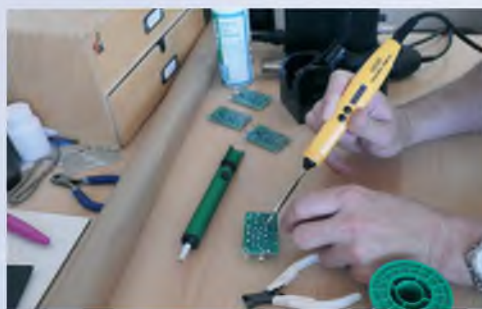


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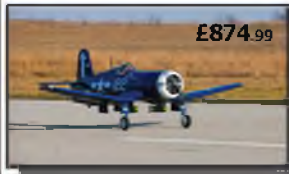
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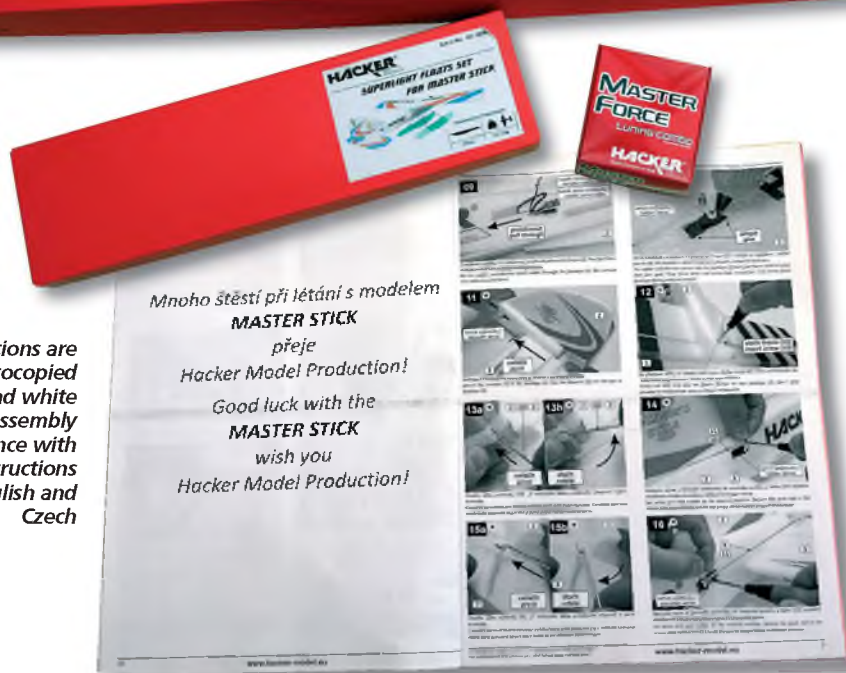


# MASTER STICK

Hi-flyer Frank Skilbeck enjoys some foamie fun flying with this 1200 mm span sporty aileron trainer from Hacker Model Production



Master Stick kit and optional motor tuning combo and floats are all supplied in bright red boxes



Instructions are a photocopied black and white photo assembly sequence with instructions in English and Czech

Mnoho štěstí při létání s modelem  
**MASTER STICK**  
přeje  
Hacker Model Production!  
Good luck with the  
**MASTER STICK**  
wish you  
Hacker Model Production!

**H**acker Model Production have been increasing their range of expanded polypropylene (EPP) models and the revamped Master Stick is one of them. Available in four colour schemes, which are printed directly onto the foam, this is a 1200 mm wingspan model that is suitable as a follow-on aileron trainer or general all-rounder. It's an ideal model for those impromptu flying sessions and claims to be

'almost unbreakable' so it's a model that you are likely to be comfortable taking liberties with!

The model is supplied as an ARTF kit needing servos, motor, ESC, battery and your chosen radio gear. Also available (and supplied with the review model) is the recommended Hacker tuning combo comprising of a Hacker 2830CA-12 980 KV brushless motor with mounting kit and a 22 amp ESC.

## On With The Build?

The model is supplied in a bright red box with an added sticker showing specifications and a photo of the finished model. Opening the box reveals the complete main wing, with the fuselage, tailplane and accessories underneath. All the major components were wrapped in a clear plastic film. The optional motor and ESC tuning combo are in their own separate box and come with the motor/ESC and ESC/battery connectors already fitted. The instructions are provided in a photocopied booklet comprising some safety notes, a photographic assembly sequence, set up instructions and some flying notes.

The instructions supplied had been stapled in the wrong order but as the pages and photos were all numbered this wasn't a problem and they are quite clear and easy to follow. Construction is all foam, with ply reinforcement where required. The foam used is of a coarse type, but none the worse for that. Interestingly the colour scheme has been printed directly onto the foam, so there are no decals to apply.

The airframe is provided with recesses to install your favourite mini 9 g servos and I chose E-Max ES08MA units for all the flying surfaces. As the servos are hot glued into their respective slots the servo arms and pushrod connectors have to be fitted to the servos and centred before they are finally fitted in position, as shown in the instructions.

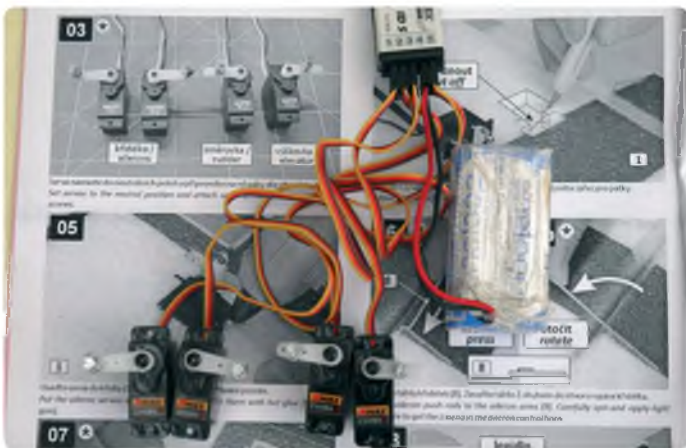




Hacker motor and 22 amp ESC with the supplied battery connector, which accepts both XT60 and EC3 plugs



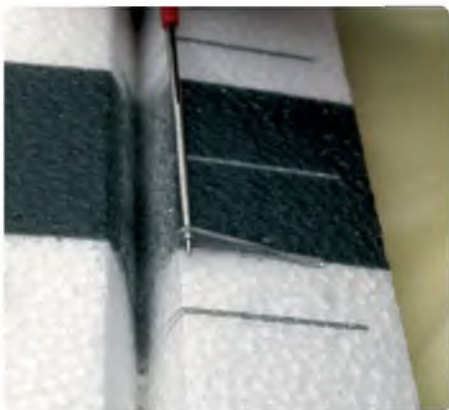
There are not many parts to assemble



It is important to centre the servos and to fit the arms and pushrod connectors before the servos are glued into the wing



Recesses for the servos need trimming with a sharp knife to take your chosen units



Holes in the clear plastic control horns needed to be slightly enlarged for the supplied pushrods

Once the servos have been hot glued in (the rudder and elevator servos require short extension leads as they are fitted in the tail), the control surfaces can be hooked up to the neat clear plastic control horns that are pre-installed using the cut to length pushrods with a Z-bend. I found the holes on the control horns slightly undersized for the pushrods but a couple of minutes with a needle file had them fitted without any play. The length of the pushrods was such that by rotating the servo arm and moving the control surface they could be easily threaded into the pushrod connector on the servo arm.

The horizontal stabiliser is fitted into a slot in the fuselage and held in place by a machined screw that clamps it into place,



Control rods provide a direct slop free linkage

allowing the stabiliser to be removed. This enables you to make the model more compact for transportation. On the review example the plastic receptacle that the screw should go into hadn't been drilled out, but this was easily rectified by drilling out and then tapping a thread in it; hopefully this was just an isolated instance.

The motor is screwed to the fitted ply bulkhead using self-tapping screws. The ply mount is predrilled but on the review example a couple of the holes were plugged with glue and I had to drill a pilot hole to get the screws to bite. Once done the motor was fitted easily.

The ESC sits in a slot in the fuselage just behind the bulkhead and is covered by a foam 'hatch' that is spot-glued into

position. But not until after you have checked the motor is running in the correct direction as the connectors are not easily accessible once the hatch is glued in place.

The battery connector has to be threaded around the ply undercarriage box bulkhead. This was very tight and I found it easier once I'd sculpted some of the internal foam away. The battery sits in an open bay on the underside of the model and is held in place with a plastic clip, while the receiver sits on a foam plate above the battery underneath the wing. I used a Multiplex RX-5 M-LINK 5-channel compact receiver and this fitted neatly in the available space, but larger receivers may not fit and space is so limited that end connectors on the receiver are pretty much





*Horizontal stabiliser slots into position*



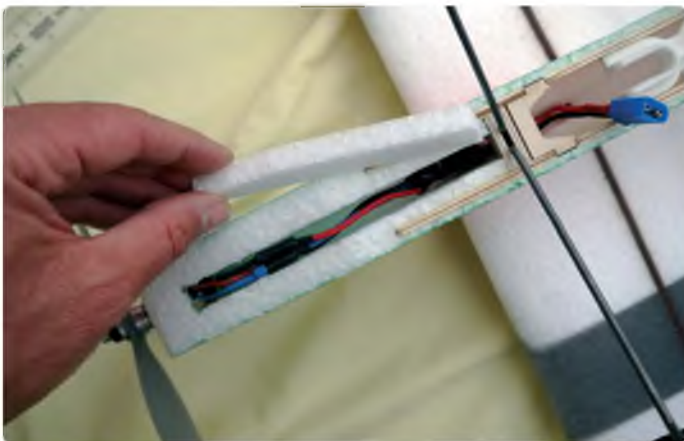
*The horizontal stabiliser is held in place with a machined screw. On the review model the plastic housing in the fuselage hadn't been tapped to suit*



*Motor bulkhead is pre-drilled for the self-tapping screws. Two of the holes were plugged with glue and needed to be re-drilled before the screws would 'bite'*



*Motor is easy to fit and the exposed location will provide good cooling*



*ESC sits behind the motor bulkhead and is covered by a simple foam cover that is spot glued in place*



*Receiver sits below the wing. Space is tight so a compact receiver is required*

essential otherwise more foam surgery will be required.

The undercarriage is a simple wire affair with large 90 mm diameter lightweight foam wheels held on by quick-lock fixing washers. The undercarriage is slotted into the ply box in the fuselage and held in place by squeezing the wire and slotting it into place. The combination of the spring force and friction hold it in place. This makes fitting and removal very simple and quick. There is no tail wheel, just a foam skid, which has proved fine on our grass strip. But if you fly from an abrasive surface it may wear away quickly.

### **Final Set-Up**

With the receiver fitted and the wing

bolted in place a flight battery was fitted and the control surfaces set-up, with high and low settings as shown in the manual. As recommended in the motor instructions a 10" x 5" APC-E propeller was fitted. The spinner provided is quite a compact affair and the propeller retaining nut is recessed within the spinner. It proved impossible to tighten it using either an open-ended spanner, a regular socket or a box spanner so it was omitted and the plane was tested without a spinner.

The battery bay is just big enough to take a 2200 mAh 3s LiPo and Hacker suggest batteries between 1300 mAh and 2200 mAh. As I had a few 1300, 1800 and 2200 mAh batteries with a suitable plug already fitted I checked the balance with

each of these fitted separately. The smaller batteries needed to be placed forward in the battery bay to ensure the Centre of Gravity was within the recommended range and I made up some foam spacers to sit behind the battery to keep the smaller batteries in place.

The batteries are a snug fit in the battery bay and are held in place by a simple plastic X-clip, which locks into slots into the ply sides, which reinforces the foam. This not only makes for good battery cooling but is also easy and quick to use.

A quick check with my wattmeter and tachometer showed the motor was turning the 10" x 5" prop at 8,100 rpm and drawing 14.5 amps (approximately 165 watts) on a freshly charged battery. So I set





The LiPo is fitted from the underside and held in with a simple plastic 'X' brace, which locks into slots in the ply reinforcement. Note the foam spacer to make sure battery doesn't slide backwards



Ready for the maiden flight. Master Stick is functional rather than stylish



Master Stick takes-off easily



Landings are stress free as Master Stick can be slowed down to walking pace and the large wheels prevent nose overs on less than perfect surfaces



Low, slow flying below head height is very satisfying



Master Stick can do a nose up stall if too much down is fed in whilst flying slowly when inverted. Prompt application of power and some 'up' elevator is needed to get the nose down

my throttle-linked timer to 7 minutes. With a final weight of 1.6 lb (725 grams) this gives a power-to-weight ratio of just above 100 Watts per pound, which is more than adequate for this type of model.

**Almost Unbreakable!**

Shortly after finishing the model we were presented with a sunny day with just a whisper of wind – ideal for testing the model. Lined up on the strip, the throttle was gradually opened and the Master Stick accelerated away and into the air. As expected the Master Stick is easy to fly through all the normal aerobatics; loops, rolls and stall turns are easy if not very precise, knife-edge is possible but there is quite a bit of roll coupling and opposite

aileron needs to be held in so knife-edge is not very tidy (well at least in my hands!). Slow flight is a delight and it was possible to fly round at slow speed a couple of feet off the ground, which made the photographer's job very easy.

However, when flying inverted the Master Stick does have an unusual trait. Most of the time it flies just fine, but if you push in too much down and allow the nose to come up when flying slow, it seems to go into a deep stall that needs a positive application of 'up' elevator to pull the nose down. I'm not sure if this is a function of the wing section or whether it's the large wheels that are now above the fuselage creating an inverse pendulum, which combines with the drag from the wheels to

pull the nose up.

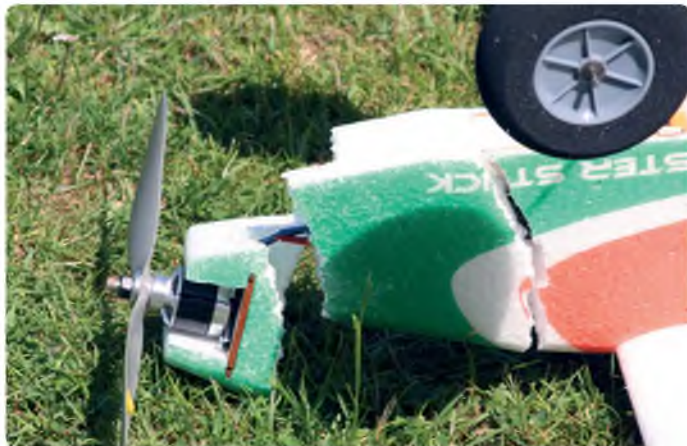
Once we had discovered this a few mistakes high, we thought we would try and get some slow low inverted passes for the camera. And as you've probably guessed it went into a deep inverted stall and application of 'up' and power saw the Master Stick slam into the hard ground. This did prove that it is 'almost' unbreakable as I'd snapped the nose off, but this was easily repaired with some foam-friendly cyano and we were back flying within 20 minutes.

In the catalogue Hacker show the Master Stick towing their SKG series gliders. These are gliders with a wingspan around 2 m and weigh less than 800 grams. Not having one of these, but the slightly larger





Stripes on the undersides of the wing and tail help with orientation



Above & below: If it all does go wrong... A quick repair with cyano will soon have you back in the air!



Master Stick is relaxing to fly with no untoward habits in normal flight. Open the tap and it's aerobatic too!



2.25 m wingspan Parkzone Ka8, we attached a towline to the rear of the wing of the Master Stick and gave it a go. The Master Stick got the Ka8 into the air but the glider quickly pulled around the Master Stick and both planes came to the ground rather abruptly, needing some more foam surgery. The power from our set-up was not really up for aerotowing and maybe we should have fitted a larger propeller to increase the power available.

**Summary**

It does what it says on the tin. The Master Stick is a great little model for recreational flying, especially if you're flying from a restricted space where the light weight and easy handling (at least when kept the right way up) make this model fun to fly close and low. I also buddied the Master Stick to my transmitter and allowed an absolute 'newbie' to fly it, who had never tried R/C flying before (not even on a simulator) and after turning the controls down a bit he was starting to get the hang of flying after a couple of flights.

The review kit did have a few assembly quibbles but these didn't significantly hold up the assembly, nor the performance or appearance of the finished model. Speaking of appearance, the Master Stick couldn't be described as pretty but it is functional and the printed colour scheme gives it a distinctive appearance.

All in all the Master Stick is an easy to fly model. And while it isn't unbreakable it is pretty durable. We have a set of floats to be fitted for some off-water fun and we'll report back once we've had a splash about.

**RCMW**

**CONTACTS**

**Hacker Models**

www.zoomport.eu  
shop@zoomport.eu

**RC MODEL WORLD DETAILS**

**MODEL INFORMATION**

**NAME:** Master Stick  
**MANUFACTURER:** Hacker Model Production Ltd  
**WEBSITE:** www.zoomport.eu/shop/ (search for Master Stick)  
**PRICE:** 95 Euro  
(see also: www.t9hobbysport.com/hacker-models-master-stick-rtf-electric-trainer)  
**MODEL TYPE:** Aileron Trainer/Sports and Fun Fly  
**CONSTRUCTION:** EPP foam  
**PARTS SUPPLIED:** EPP foam airframe, accessories and wheels  
**PARTS REQUIRED:** Motor, ESC, propeller, 3S LiPo, Rx and servos  
**EC. MOTOR:** Hacker M-Force 2830CA-12 980KV  
**REC. ESC:** MC-22 A  
**REC. BATTERY:** 1300~2200 mAh 3S LiPo  
**REC. PROP:** APC-E 10" x 5"  
**SERVOS USED:** E-Max ES08MA (12 g) 1.6 kg/cm @ 4.8 V

**OPTIONAL ACCESSORIES**

**TUNING KIT:** 43 Euro  
**SUPERLIGHT**  
**FLOATS:** 32 Euro

**R/C FUNCTIONS**

1: Ailerons    3: Throttle    5: Aileron  
 2: Elevator    4: Rudder    (if using flaperons)

**MODEL SPECIFICATIONS**

**WINGSPAN:** 1200 mm (47 in)  
**LENGTH:** 940 mm (37 in)  
**WEIGHT:** 700 g (25 oz)  
**REVIEW MODEL**  
**WEIGHT:** 725 g (26 oz) with 1300 mA LiPo

**DISLIKES**

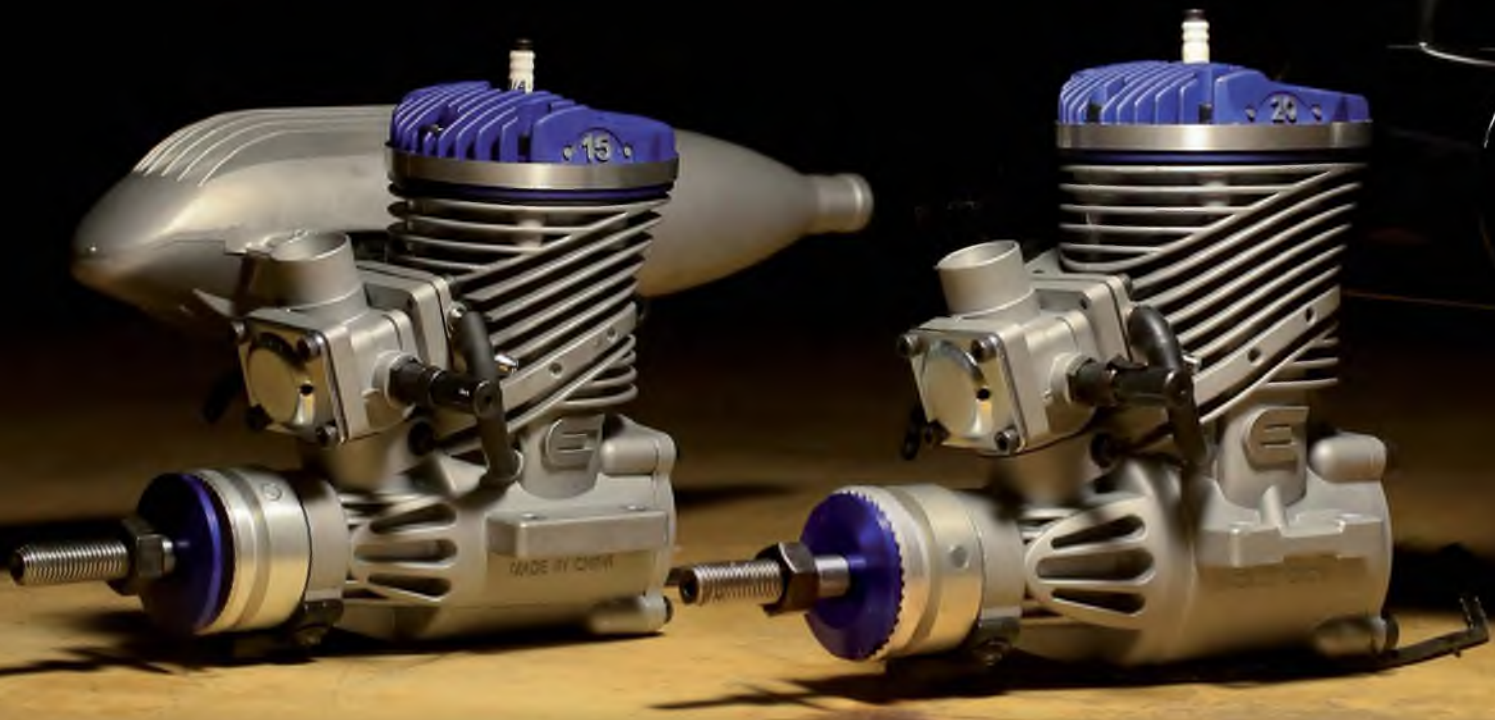
Some minor quality issues  
 Nose up stall when inverted

**LIKES**

Quick assembly • Easy to fly • Disassembles quickly for transport • Durable and easily repaired



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# WARBIRDS OV

Neil Hutchinson plays Time Lord to revisit the 1940s and see his favourite aircraft, the de Havilland Mosquito

**A**nyone who knows me well knows I'm a huge de Havilland Mosquito fan. In my view it was the greatest multi-role aircraft ever built! There are now only two flying Mosquitoes left; a Mosquito B35, VR796, which recently flew in Canada and KA114, a Mosquito FB26 that first flew in 2012. Of the two Mosquitoes, KA114 is the only one that is regularly flying. I first saw KA114 in 2013 at the Canadian Warbirds Heritage Museum's Hamilton Airshow. I decided it was time to see her again and where better than on home turf at Virginia Beach.

I decided to go to the Military Aviation Museum's show, Warbirds Over The Beach. I planned to arrive there on the Thursday in time for the first practice day and stay for the whole weekend.


## Practise Days

When I arrived at the museum the first thing I saw was a line up of WW2 fighters sitting on the edge of the hot pan adjacent to the big Military Aviation Museum (MAM) hangar (which I reported on last month). The hot pan is the concrete hard standing outside the hangar where the aircraft are usually started. I quickly got my media pass and set about photographing the assembled warbirds as fast as could.

I soon found out that things at Virginia Beach are a lot more laid back than in the UK and that there is plenty of time to get all the pictures you want. The aircraft are very accessible, there are no barriers and you can get very close. It was only when the aircraft are being started up that pan was cleared for safety reasons.

Thursday morning is a very good day for getting your static photos because there are a lot of pilot briefings and there are not that many other people around. The flying started in the afternoon.

The two practise days are for the pilots and aircraft to be checked out to the satisfaction of the American Federal Aviation Authority (FAA). Old aircraft need to be thoroughly checked out and looked over and the pilots need to get used to 'their' aircraft. MAM maintain the aircraft to a very high standard but occasionally minor things do go wrong and need to be fixed. Unfortunately, the Supermarine Spitfire had an engine problem. The Merlin engine was running lean and could



After the barbeque on Saturday it was worth wondering around the airfield getting some lovely sunset pictures. Seen here is the Supermarine Spitfire Mk IXE



# ER THE BEACH

not be fixed in time.

The problem was later found to be a sticking carburettor diaphragm.

These things happen!

At the show, over the whole weekend, there are a lot of WW2 re-enactors and these guys started to arrive on Friday. The various camps were soon set up. We had various groups like 601 Squadron, the 175th Engineers, Fallschirmjaeger Regiment 6, 1st Canadian Parachute Battalion and several other groups, too. These various groups took the weekend very seriously, with their authentic combat dress and equipment.

Friday saw the arrival of some 'guest' aircraft that would display over the weekend. First to arrive was the Commemorative Air Force (CAF) 'red nose' P-51D, closely followed by their Douglas Dauntless. Not long after a Curtiss C-46 Commando arrived.

The C-46 would be used to drop paratroopers during the show on Saturday and Sunday. The weekend was

starting to get much busier and even more interesting.

During the whole of the Warbirds Weekend there was continual flying. I took the opportunity to have a flight in a PT-19 trainer. However, if you wanted to spend a lot more money you could have a flight in the beautiful MAM Waco, or even the CAF P-51 and Dauntless. Plenty of people took up the offer of these flights.

### Warbirds Over The Beach

The air show at MAM has strict regulations placed on it by the FAA and so the actual aircraft display line is set diagonally to the western end of the main runway. The planes fly an oval flight path and are usually in groups of four to six aircraft. These groups are divided up into flights of aircraft type such as liaison aircraft, US Navy aircraft, European Theatre aircraft etc. The length of the flights varied from 10-15 minutes, so there was plenty of time to see the displaying aircraft.

The show got underway with members of the WW2 Airborne Demonstration Team's paratroopers embarking into the C-46 Commando. The C-46 took off and after a couple runs over the airfield to check the wind direction the paratroopers made their jump. One thing I have not mentioned

thus far – MAM possess a fully operational German 88 mm anti aircraft gun. This was manned by members of the 62nd FLAK Regiment, who crew and maintain the 88 mm AA gun. They are also responsible for firing it at 'attacking' aircraft throughout the air show. The C-46 had several rounds 'fired' at it as the paratroopers made their drop.

Once the paratroopers had landed the airfield was opened up again and the aircraft started to take-off and display. The displays started with liaison aircraft such as the Stearman, Stinson L-5, Tiger Moth, Chipmunk, etc. These were followed by US Navy, Pacific Theatre aircraft, which included the PBY 5a, Corsair, Avenger, Skyraider, etc. The European Theatre aircraft were divided into two groups, US and German/British. The two groups had the B-25, P-51, P-40 and Ju 52, Me 262 and Hurricane.

The Me 262 arrived from another airfield to display. There are landing restrictions on the Me 262, which means it is not allowed to land on a grass runway.

The climax of the flying display was undoubtedly the Mosquito. This initially flew with the Yak-3 and Hurricane before doing a solo slot.



**The Attractions**

Throughout the weekend there were many separate attractions to keep the whole family interested. The re-enactors are certainly an interesting bunch of characters, who take the whole set-up very seriously. They set-up their individual encampments, complete with equipment etc. and are only too pleased to chat about their hobby.

The re-enactors gave the whole weekend a 1940s feel to it and this theme was carried on by the live entertainment in the main hangar. The artists included a group called The Victory Belles, who were very popular. There was also the Mark Michielsen Big

Band, who played all the 1940's big band music. Two comedians, Bill Riley and Joe Ziegler, played out some very funny Abbot and Costello sketches.

Saturday evening was extremely interesting. After the flying had finished the barbeque was lit and it was time for food! Later on, after everyone had eaten, the hangar was cleared and it was dance time. The Museum rolled out its end of party treat – a working V-1 pulse jet engine and started it up. I have to say, listening to the noise it made, close up, is one of the most sinister sounds I have ever heard!

This evening period is also an excellent time to wander around the airfield, taking

evening sunset pictures of the parked aircraft and chatting to Fighter Factory staff. The guys were relaxing after a hard day keeping the show on the road.

All in all this was a thoroughly enjoyable few days, which I would highly recommend.

The air displays are very different to those in the UK, mainly because of FAA restrictions.

However, there are many aircraft flying at Virginia Beach that you won't see anywhere else in the world. Everyone is very friendly and very keen to show off the fabulous MAM collection. Will I be going again? Yes, most certainly!

**RCMW**



*Beautiful Waco YMF-5. This aircraft is a replica built in 1989. It flew passenger flights throughout the whole weekend*



*Mike Kuhnert had a very busy weekend flying his PT-19 trainer. Plenty of people wanted a flight experience in this lovely aircraft*



*Approaching the MAM landing strip*



*The Me 262 makes a fly-past*



*The superb Goodyear FG-1D Corsair, one of Gerry Yagen's earliest acquisitions*





Canadian built Hurricane LF Mk XII. The Hurricane was built in 1943 and is painted in the colours of 151 Squadron. The Hurricane had a minor hydraulic leak during its first flight, which was soon fixed



F-18 Hornets regularly overfly the airfield. The huge Oceana Naval Air Station is only a short distance away



An unusual and rare aircraft, the North American P-64. This P-64 is a replica aircraft based on a North American SNJ-4 and arrived at the museum in 2001



The Yak-3 was restored by the Yakovlev Company in Russia and uses many original parts. The engine is an American Allison V-12 engine



Best display of the weekend was undoubtedly by Kevin Sinibaldi in the massive Douglas AD-4 Skyraider. Seen here diving down with the huge dive brakes deployed



The MAM Junkers Ju-52 was originally built by CASA in 1949 and was bought by the Commemorative Air Force in 1976. It was grounded for many years with engine problems. Purchased by MAM in 2010, they installed new Pratt & Whitney 1340 engines and 3-blade propellers and returned the Ju-52 to flying status



The aircraft that started it all off for Gerry Yagen, the Curtiss P-40E Kittyhawk. The P-40 is a beautifully restored aeroplane, with the work done by AVSpecs Ltd in New Zealand





**Above:** The Mosquito and Hurricane flew together in the WW2 European Theatre flight, along with the YAK-3

**Left:** Mike Spalding, MAM's chief pilot, at the controls of Mosquito FB26 KA114. She was totally rebuilt from many new parts made by Glynn Powell and put together by AVSpecs Ltd. in New Zealand



Members of the WW2 Airborne Demonstration Team opened the air show with their parachute drop from the Curtiss C-46 Commando 'Tinker Belle'



Lovely Messerschmitt Bf 108 liaison aircraft. This machine was built by Nord Aircraft, France in 1945. It was originally a Nord 1002 before being painted in its present Luftwaffe markings



There were several A2A (aircraft to aircraft) photo sessions on Thursday and Friday. These were done by Luigino Caliaro (L) and Gavin Conroy. Photos from these two photographers appear in many magazines such as Flypast



The MAM Grumman TBM-3E Avenger is finished in the colours of Torpedo Squadron VT-51. This particular aircraft represents the one flown by former American President George Bush, Snr



Gerry Yagen at the controls of the superb P-51D Mustang 'Double Trouble Two'







One of several visiting aircraft, the Commemorative Air Force's P-51D. This aircraft is immaculate in every detail. It flew throughout the weekend with members of the paying public

Detail in the P-51D's gun bays was excellent



The other Commemorative Air Force aircraft over for the weekend was the Douglas SBD-5 Dauntless. This was another aircraft you could purchase a joyride in. It was a very busy aircraft throughout the weekend



The aircraft at MAM are really well looked after but occasionally things go wrong. The Spitfire's Merlin was running very lean and could not be fixed in time for the show. A sticking carburettor diaphragm was later found to be the cause



Curtiss C-46 Commando 'Tinker Belle' taking-off from the grass runway at Virginia Beach



Another lovely and beautifully restored aircraft, the Stearman PT-17 Kaydet



Douglas TBM-3E Avenger sits with its wings folded back waiting to fly



Gerry Yagen's B-25J Mitchell 'Wild Cargo'. It started its military career as a surveillance aircraft with a 'solid' nose section. The B-25 was restored in 1997 and the clear nose section was added, taking the B-25 back to the original 'J' specification





*Hawker Hurricane LF Mk XII undergoing magneto checks prior to its first flight of the week*



*Yours truly in front of my favourite aircraft, the de Havilland Mosquito*



*Members of the Luftwaffe Aircrew Re-Enactors Association pose in front of the replica Focke Wulf FW 190 A-8*



*Early morning, before the crowds arrive. The re-enactors camps have all been set up*



*The German 88 mm anti aircraft gun was 'fired' several times during the aircraft displays. It creates quite a bang!*



*Members of the Capital Wing of the Airman's Preservation Society pose in front of the Curtiss P-40E*



*A genuine 1940's WW2 Jeep nearing the end of a long restoration. It still has the original engine, which has been rebuilt to working condition*



*One of the most sinister sounds I have ever heard – an original working V-1 pulse jet!*



*The Tidewater Radio Control Ghost Squadron, based at Chesapeake, Virginia, regularly display their models at MAM shows. I had a long chat with Ruperto Asiatico about the superb models on show. The Mustang P-51D is a beautiful replica of Jerry Yagen's 'Double Trouble Two'. The model has an 86" wingspan and a DA 50 cc petrol engine. The P-51 is covered with Flite Metal, which gives it a lovely scale finish*



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*Pontefract and District Flyers and Bickershaw MFC hosted the Traplet Open Scale 'War of the Roses' competition for the second year, as Peter Maw reports  
Additional photography by Theo Dibbetts and Alan Glover*



*Pontefract winning 1:4 scale Garden GY20 Minicab (Traplet plan MW2001) was flown by its designer Dave Womersley*

# TRAPLET OPEN SCALE 2015



*Geoff Wood and Phil Kent prepare for a long day's judging at Bickershaw*



*Phil Kent (from the Brighthouse MAC) took an opportunity to fly his 54 inch span Comper Swift during the lunchbreak at Bickershaw. The Traplet plan (MW3487) and laser cut woodpack (WP3487) for this plane was the top prize at the event*

In 2014 Traplet re-introduced their popular Flying Only scale competition with events in Yorkshire and Lancashire, dubbed the 'War of the Roses'. Yorkshire were soundly thrashed and all the prizes went to Lancashire flyers, so pride needed to be restored in 2015. Claiming that Mick and Jim Reeves were from Yorkshire, as they live somewhere to the east of the Pennines was a bit much, but Lancashire rose to the challenge.

## May 2015

9 degrees centigrade, glowering clouds, winds gusting to 22 mph, wind turbines on top of the Pennines looking like they were about to take-off and pilots having to wear gloves to be able to feel the sticks – welcome to spring in Britain! As the windssock and wind-speed meter did not dislodge from their mountings this year we can take it that the wind was less strong than last year, or more likely the attachment points were stronger... Despite

the weather, competitors turned up from the west coast and East Anglia.

When a world-renowned scale modeller and flyer suddenly finds his 3 metre span, 13 kg biplane flipped onto its side on a landing approach you know the weather is foul. That is what happened to Mick Reeves and his Sopwith 1½ Strutter. Being a superlative pilot he was able to recover the situation and land safely. Afterwards he said he had left his Spitfire in the van because the Strutter handled the winds better!

The promising beginnings of the competition last year were continued this year with a wide variety of models flying at both rounds, ranging in size from 54 inches wingspan to 122 inches, and from 5 lb to 28 lb weight.

## What's It All About?

Part of the reason for the Traplet Open Scale competition, which was originated by Phil Kent more than 10 years ago, is to

encourage a new generation of flyers to have a go at a competition. Recognising that many people do not have the time to build a model from scratch the competition is open to any fixed wing model that has a reasonable resemblance to a full size, but the flyer does not need to have built the model. There is no need to provide documentation to accompany the model, which means the entrant can concentrate on the flying only. Over the two rounds of this year's competition around 60% of the planes were from kits, some ARTE, some builder's kits, and several purchased second or third hand.

Although several high profile flyers came to each event the majority of entrants at each round were club flyers looking for an interesting day's flying.

Round Two at Bickershaw on 9th August was also part of the Northern League Scale competition organised by Alan Glover from the Skelmersdale club. This is an inter-club competition in the North-west where clubs





Bring whatever size plane you are comfortable with. The author's Fokker D.VIII (Traplet plan MW3599) was the smallest plane at both events and it is dwarfed by Mick Reeves' 1 1/2 Strutter



Representing Lancashire, Andy Bowman flew his World Models Clipped Wing Cub, covered in SIG Koverall for extra durability



After acquiring it, Liverpool club member Barry Sherborne re-covered and lightened this 1:4 scale Rearwin Speedster 01, powered by a Moki 210



Ant Cliffe is from the Arrowe Park MFC and this is his Seagull Models 2 m span Zlin Savage Cruiser fitted with a 1.20 four-stroke



From the Skelmersdale MFC, Alan Glover flew this 67 inch span FSM Sukhoi Su 26 with a Laser 1.50 four-stroke for power

compete against each other and pilots from each club score points to determine which club wins the competition over the whole of the season. The schedule is almost identical to the Traplet schedule and each round has attracted good numbers of competitors over the last two years. With the added incentive of generous prizes provided by Traplet attendance was excellent. Competition flying started at 10.15 am and did not finish until 5.15 pm.

**Flying Round In Circles**

There is nothing complicated in the flying schedule, but the discipline of flying accurate aerobatics and manoeuvres in front of two judges makes people really think about how they fly. And if you have

made the effort to turn up at a venue you will fly in virtually any conditions to make sure your day hasn't been wasted. Once you have flown in a scale competition there will be very few days when you feel it would be unsafe to fly, which means there are more flying days in the year!

General procedure flying such as Figures of Eight, Straight and Level flight and a Descending Circle all seem straightforward. But to get top marks the centres of each procedure have to be directly in front of the judges at a height that the judges can easily see, and the manoeuvre has to be performed in a manner similar to the original plane.

The judges will want to see precise, accurate flying if your model is an aerobatic

Extra or a CAP, but old timer models wouldn't be expected to do perfectly circular loops with level entry and exit points. You might decide that an aerobatic ARTF is more predictable to fly and give a better chance of higher scores, but the opposite side of the story is that everything has to look more accurate to get higher points. A model like the DLE55 powered P-51D Mustang belonging to Cliff Tween would be expected to cut through any turbulence in virtually all conditions. That can be really difficult to do in a strong crosswind, for example.

**Who Turned Up?**

Modellers who like building, modellers who like flying, modellers who like a bit of



## TRAPLET SCALE

both, national champions, and club flyers who want to improve their skills. All were represented over the two events.

The youngest flyer was Dale Wood, who only passed his BMFA 'A' certificate at the end of the 2014 season. Everyone who turned up talks to everyone else and if help was needed there is always someone to provide it. Having a plane at a competition is a bit like walking a dog in a park; people just come up to you and talk to you about your possession, whatever it is. Do you want to chat to someone who has an ARTF that you have always dreamed of owning, or talk to someone about how they built a Nationals winning plane? Just come to a Traplet Scale competition and ask.

Starting at almost the beginning of powered flight, Peter Willis from the Thirsk club brought a 1:5 scale Blackburn Type D Monoplane to Round One. This 15-year-old, 78 inch span plane is powered by an equally old OS 90FS. It was only his third scale competition and he decided to enter to polish up his flying skills. As Peter is the primary author of the BMFA Flying Training Manual 'A Flying Start', he obviously knows how to fly already but wants to get better. The model was originally built from a K&W kit. It features real wing-warping through a system of pulleys and wires that lift and lower the wing trailing edges, and the pilot moves with the control stick movement. It's fascinating to look and to marvel at Peter's engineering ingenuity.

Unfortunately all the judges in this competition look for is the flying performance of the plane. None of the judges actually examined any of the planes



*Above & below: Bickershaw MFC club member Brian Wood scratch-built this beautifully-detailed 92 inch span Hawker Hurricane (and incorporated his own design scale retracts) from a plan designed by Brian Taylor. The model uses an OS 200 for power*



*Dale Wood's Sbach 342 is electric powered. We think Dad Brian might have had something to do with the assembly? Dale is also from Bickershaw MFC*



*Cliff Tween is a member of the Pontefract and District Flyers Club. He brought along this 86 inch span P-51D Mustang from Phoenix Models and powers it with a DLE 55*



*This 1:4 scale L'il Toot is only 57 inches span! It was constructed by West Yorkshire MFC member Colin Terry from a Phillip Kent plan (Traplet plan MW2762) and has a flying weight of 10 lb. It is powered by a Laser 1.20 four-stroke*



*Another in-flight shot of Southport MFC member Dave Womersley's Gardan GY20 Minicab, powered with an OS 1.20 four stroke. The model was built in 1992 from his own 1984 plans*





**Above & below:** Representing Yorkshire (in his dreams!), Mick Reeves flew his own design 112 inch span kit Sopwith 1½ Strutter at 1:3.6 scale with a Laser 360 twin



before they flew, so there's no chance of bias for classy building.

The previously mentioned Phoenix Model P-51D Mustang flown by Cliff Tween from the Pontefract club certainly made its presence felt in the sky. The ARTF was modified to take Robart retracts, and the DLE55 Rear Exhaust engine is fitted with exhaust restrictors to quieten everything down. Although this is a fully aerobatic and powerful fighter model, Cliff was able to demonstrate manoeuvres such as extending and retracting the undercarriage and dropping the dummy fuel tanks as part of his schedule. In gale force winds this could have proved to be a wise choice, but the procedures have to be done almost perfectly to get good marks. Which means it might have been wiser to do a Split-S or Immelmann.

Making these decisions is a difficult choice for the pilots, but it certainly adds interest for everyone who flies. In this type of competition pilots can change their schedule while they are flying. All they have to do is tell the judge what manoeuvre they are going to do next and call 'Start' and 'Finish' at the appropriate time. Too windy to do a crosswind Touch and Go? Substitute a Split-S instead. The flexibility is useful, but you have to be confident of your flying skills.

Over the two events there was a nice variety of models from the early 20th century Blackburn up to a BAe Hawk jet flown by Paul Lawton during Round 2. Some flyers had different models at each event; Brian Wood flew an Sbach at Pontefract and a Hurricane at Bickershaw.



Ian Bottell's 92 inch span Blackhorse Ryan STA has a CRRC 26 cc petrol engine up front. Ian is a member of the Wirral MFC



Jim Reeves (allegedly from Yorkshire!) brought along his Mick Reeves Models 1:3 scale, 122 inch span Bristol M1c, which was designed by his father, Mick. The model weighs under 15 kg, including 3 kg of batteries and a Turnigy motor



Blackpool MFC member John Higgins flew his 72 inch span electric powered Hangar 9 Inverza, fitted with a Hyperion Z5035-20 motor, a 100 A ESC and 12S 5000 mA LiPos turning an APC 20" x 10" E prop



This Laser 1.80 four - stroke powered 1:4 scale FSM Pitts Special ARF was flown by Keith Fear from Skelmersdale MFC. The model spans around 63 inches and weighs in at around 13 lb



## TRAPLET SCALE

This was very inconsiderate of him as the Hurri' is black and the sky was dull when he flew. Peter Willis had a Rollason Condor for the second round.

### Spare A Thought For The Judges

Phil Kent judged both the rounds of the competition, helped by Jim Dobson at Pontefract and Geoff Brown at Bickershaw. These guys put in sterling work at both events. They sit in front of the pilots so they get the best view of everything that is happening. It can be quite disconcerting standing behind them and listening as they give a critique of your flying, but at least it means your second round flight should be better than your first round flight.

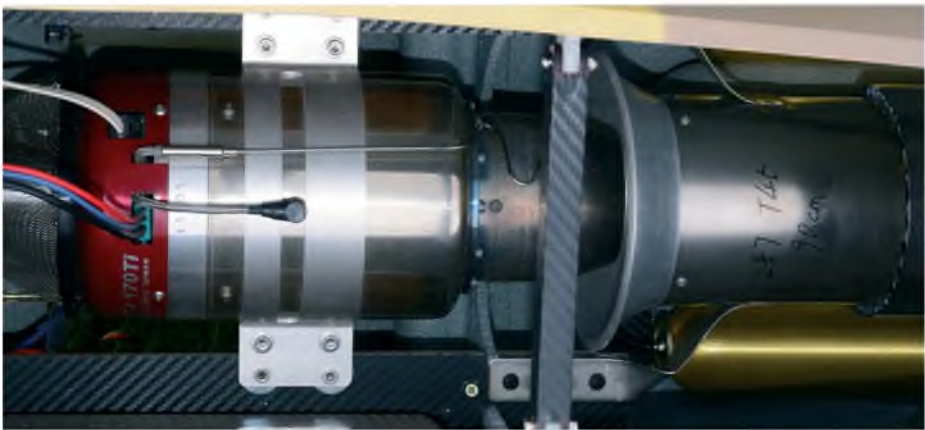
At Bickershaw, where the local club put on a BBQ, Phil Kent flew his electric Comper Swift in the lunch break to show off the Laser Cut Woodpack and Plan that Traplet donated to the best pilot over the two events. This turned out to be Alan Glover from Skelmersdale, who flew a 67 inch span Laser 150 F/S powered ASM ARTF Sukhoi Su 26.

Other prizes donated by Traplet included magazine subscriptions, plans vouchers, plans books and tools from the extensive range they sell online, which made it very worthwhile to try hard in the competition.

**RCMW**



**Above & Below:** This highly-detailed BAE Hawk is from a Fly Eagle composite 2 m kit and is fitted with a ATJ 170 turbine. It flew superbly in the hands of its owner, Paul Lawton from the Bickershaw MFC



In the Yorkshire event Peter Willis from the Thirsk MFC flew his Blackburn Monoplane, built around 15 years ago from a K&W kit. Note the yards of wire rigging and complicated wing-warping pulley system



In the Lancashire event, Peter Willis brought along his scratch-built Rollason Condor, powered by OS Gemini twin



Roy Harriot is from the Bickershaw MFC and he flew this ARTF Edge 540 powered by ASP 90 two-stroke with great precision

## TRAPLET SCALE RESULTS

### ROUND 1 – PONTEFRACT, MAY 2015

1. Dave Womersley – Gardan GY20 Minicab (Traplet plan MW2001), built from own design (Lancashire)
2. Jim Reeves – Scratch built Bristol M1c (allegedly Yorkshire!)
3. Mick Reeves – Sopwith 1½ Strutter own design (allegedly Yorkshire!)

### ROUND 2 – BICKERSHAW, AUGUST 2015

1. Alan Glover – Sukhoi Su 26 (Lancashire)
2. John Higgins – Electric powered Inverza (Lancashire)
3. Dave Womersley – Gardan GY20, built from his own design (Lancashire)

### BEST FLIGHT OVER BOTH EVENTS

1. Alan Glover – 95.5 points out of 110 available



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# RETURN OF THE RED BARON

*Donatas Paužolis interviews Depron wizard Jürgen Schönle about his fabulous half scale Depron Fokker Triplane. Additional photography by Ignas Matulevičius, Daniel Just and Jürgen Schönle*

**A** Almost every year we travel to the Dortmund Intermodellbau expo in Germany. This fair is known as one of the biggest model hobby events in the world. It is natural that today a big part of any hobby is related to all kinds of radio controlled models. I would say the biggest part of the R/C section was given over to flying machines.

The German model flying association (the biggest flying modelling union in Europe, aka the DMFV) was located in the same hall. The DMFV, together with the fair organisers, try to make the show more attractive and they organise an interesting indoor flying show that runs during the five days of the expo. These hour long shows are held four times a day and showcase various types of indoor flying. Even for me, a modeller with over nineteen years of experience, some show elements are unexpected and are really impressive. There has not been a single year when I have not seen exceptional models and extraordinary flying.

In past years Martin Muller has demonstrated his innovative designs and provided great pleasure with the realistic flights of his scale Airbus A-380. Already known to many readers as the builder of the insanely light 40% Depron Extra is the

great German modeller Thomas Schunk. The efforts of these men have greatly inspired the next generation of modellers.

This year I met with another top level German modeller, Jürgen Schönle. He has built many scale models from Depron. While some were small, others were 1:1 scale! Last year Jürgen brought a giant propeller to Dortmund that looked like it came from an ultra-light aeroplane rather than an R/C model. This year I had the chance to see to what this propeller was attached to, as Jürgen debuted his latest Depron creation, a 50% Fokker DR1. Jürgen kindly agreed to talk with me and answer some questions about the Fokker and his other Depron models.

**Q.** Jürgen please introduce yourself. How old are you and how long have you been involved in aeromodelling?

**A.** My name is Jürgen Schönle and I am 26 years old. I was already interested in aeroplanes while in kindergarten and started to draw them. Aeromodelling has been my hobby since I was 12 years old, so altogether I have been involved for 14 years. My very first aeroplane was an Alpha 180 by Protech.



*Jürgen Schönle with the upper wing from his Depron Fokker*



**Q.** You have built some amazingly large models from Depron. How did you come up with the idea to use this soft and fragile material for building scale models?

**A.** I discovered Depron when I was looking for a cheap material for building small park flyer models. Depron is easy to work and allows me to realise my ideas faster, while at the same time building bigger and lighter models with low wing loadings that display unique flying characteristics. Together with friends I met at airshows, we discussed how to build models which are more spectacular. So our aeroplanes became bigger and bigger.

**Q.** How many Depron scale models have you built?

**A.** So far, I have built 50 different model aeroplanes using Depron. Five of these models are big scale planes, including:

**Bf 109 G6**

Scale: 1:5.5; Wingspan: 1.80 m; Weight: 500 g; 7 servos; Functions: motor, ailerons, elevator, rudder, flaps, retractable landing gear; Specialties: self-made gearbox and propeller.

**Cri Cri**

Scale: 1:1; Wingspan: 5 m; Weight: 5 kg; 5 servos; Functions: motor, ailerons, elevator, rudder, flaps.

**Albatros DV**

Scale: 1:3; Wingspan: 3 m; Weight: 3 kg; 4 servos; Functions: motor, ailerons, elevator, rudder; Specialties: self-made gearbox and propeller.

**Piper PA 18 Bush**

Scale 1:4; Wingspan: 2.70 m; Weight: 2.5 kg; 6 Servos; Functions: motor, ailerons, elevator, rudder, flaps; Specialties: self-made gearbox and bush wheels with air tubes.

**Fokker DR1**

Scale: 1:2; Wingspan: 3.60 m; Weight: 6.5 kg; 4 Servos; Functions: motor, ailerons, elevator, rudder; Specialties: self-made gearbox and propeller (52 x 20 inch, made of balsa wood), wheels (made of childrens' bicycle tubes, wheel rims made of foam); RPM is 1600 max.



For a skilful modeller like Jürgen even a simple drawing is enough to start a massive project



Wing ribs are made from 3 mm Depron



Some of the parts and ribs that will hold the wing structure together must be rigid are made from thin plywood



Landing gear beginning to take its shape. The additional lifting surface is built the same way as the main wing



Wings partially assembled. Notice that the wing spar is formed as rectangular tube, with a flat carbon reinforcing front edge



## RED BARON

**Q.** Your latest Depron plane is a 1:2 scale replica of the famous WW1 Fokker DR1, the Red Baron's triplane. Please share some technical details about this project and the list of materials you used.

**A.** As you know the Fokker is a German design. This is quite a special aeroplane, as there are not many triplanes in the world, especially with such history surrounding it. I used two types of Depron: regular and lighter Depron Aero. It is widely available in 3 mm and 6 mm. I did not use any milling. It is not practical for a plane of this size

and, I think, not really necessary. I used a lot of carbon fibre roving and carbon rod. Flexible carbon tubes were used for motor mount reinforcement. I designed and built a special gearbox and with the right motor it added just 760 g of weight. The motor was designed/adjusted to run just on 4S LiPos. With a battery capacity of just 3000 mAh, I was able to make a ten-minute flight.

**Q.** How long did it take you to build the Fokker and what was the most difficult part of the construction?

**A.** Similarly sized models (30 - 50% scale) built from wood or composite materials usually weigh four to six times more. So in most cases petrol engines are used. Our Depron models are the same size, but we use a lighter material that cannot withstand the weight and vibration of an IC motor. Our only option therefore is to use electric motors. So we end up in quite an interesting situation. The models are really big but require relatively low power and a low weight motor/gearbox combination that can spin a large diameter propeller at low rpm. This is a rare requirement,



*Covering the landing gear wing*



*Final view of reinforced motor mount*



*Motor mount ring is made from plywood*



*Cowling parts are made using a milling machine. Hard styrodur foam is used for this*



*Motor mount is reinforced with wooden sticks, Depron and a bit of carbon cloth*



*Motor mount reinforcement does not end at the firewall. The wooden sticks go deep inside the fuselage and are glued in several places. This noticeably increases strength*



so no commercially produced systems are available. Because of this I built the gearbox and propeller myself. The build process, starting with the basic idea and ending with an actual flying model, took about one year. The gearbox/motor/prop was definitely the most difficult part. Also, carving the propeller was quite an interesting process. I've never had to make such a big propeller for an R/C model. Sure, I want it to be strong, and avoid twisting and vibrating. For this I glued several layers of balsa wood to form a plywood structure. For reinforcement between layers I added

some carbon as well. So you can see each part takes a little bit of thinking and preparation. Naturally this project took so long because I built this model after work and other activities.

**Q.** We've already seen Thomas Schunk using Depron to build big scale aerobatic models. Now we are pleased to see you are making amazing warbirds using the same technology. I am sure such models will inspire other people to start similar projects. Can you share your experience of how to build such models? Any tips?

**A.** The most important advice I can give is not to be afraid of experimenting with new materials and building techniques. I see people make mistakes building similar models because they put in too much reinforcement. This leads to extra weight and poor flying characteristics. The plane must only have enough strength to withstand flying. And then it will reward you with a pleasant flying experience.

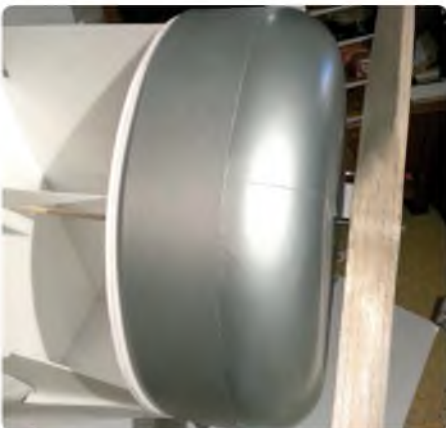
**Q.** How do you make a plan for a 1:2 scale Fokker? Did you use a computer and CNC machine to make the job easier?



*Cowling reinforcement from carbon thread soaked in epoxy*



*The old style way of making something special! A pile of balsa wood is left on the ground before the masterpiece, a 52 inch (127.5 cm) propeller, is born*



*The cowling is painted in silver, the same as the original Fokker flown by the famous ace Manfred von Richthofen (a.k.a. The Red Baron)*



*Assembled gearbox*



*The rudder is built from 6 mm Depron and reinforced with carbon tube before covering all surfaces with thinner Depron*



*Gearbox parts designed and made by Jürgen*



*Jürgen and his 52 inch indoor propeller*



## RED BARON

**A.** Since the Fokker DR1 is a popular plane it was not difficult to find accurate construction drawings online. I just needed a good three view of the aeroplane to make calculations and enlarge it to the required size. The most difficult task was constructing the gearbox, and I did use a CNC machine for that. Every other detail I built with my hands using a ruler, hobby knife, glue and sandpaper.

**Q.** Do you need any special tools or skills to build such aircraft parts?

**A.** I don't have any special tools, skills or superpowers. And, seriously, this is not

rocket science. I always encourage people to try something new. With a little bit of confidence and the help of our fellow modellers we can accomplish pretty much anything. After all, modellers are always willing to help and share knowledge. I think real aeromodelling is what we build with our hands and not purchase as an ARTF (Almost Ready To Fly). Only once we begin to think, solve problems and create something unique do we evolve as modellers.

**Q.** What kind of budget (just for materials) is necessary for such a project?

**A.** I always try to keep the budget as small as possible. You can put the material costs at around 500 to 800 €.

**Q.** What are your future plans? Do you have any new models in mind?

**A.** At the moment I'm happy with the models I have. Maybe a new model will come to mind during the next months of the new indoor season. So far we have had a great outdoor season!

Jürgen, thank you very much for your time and the ideas you have shared!

**RCMW**



For size comparison: a small Fokker DR1 (also built by Jürgen) next to its 'big sister's' tailplane



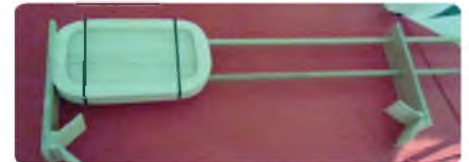
The tail section is painted. Painting the entire airframe took 14 spray cans (each 300 ml) and added 150 g of weight



Having fun with a wheel. Using a motor mount to make sure the wheel axle is in the right position. The tyre used is from a small bicycle and is inflatable



Travelling with large models requires special packing skills to cram this airframe into a Ford Mondeo



To achieve the correct wing angle, Jürgen had to create another cool tool. The box, made from balsa wood, holds a smart phone. With a 'spirit level' app installed, it is really easy to set the wing incidence (the angle relative to the fuselage centre line). Correct wing position is very important for a biplane and especially in triplane configurations!



Assembly of such a unique plane requires time and space





Fokker Triplane in flight at the 2015 Dortmund Intermodellbau Expo. The hall was about 30 m by 30 m and 10 metres in height. This was enough to make safe flights for this big, yet very light (just 6 kg) aeroplane



Author of this article, Donatas Pauzuolis, with his own models next to the big red beast!



Jürgen's amazing 1:1 Cri Cri. Wingspan: 5 m. Weight: 5 kg



Above & below: Another of Jürgen's creations - a 1:5.5 scale Bf 109 G6



Yes, the Cri Cri is flying indoors!



The Messerschmitt's wingspan is 1.80 m and it weighs just 500 g!

**Scan To See Jürgen's Big Depron Models In Flight !**



QR1  
Fokker DR1 test flights at Dortmund



QR2  
Fokker DR1 flying outdoors



QR3  
Cri Cri at DMFV Indoor Show





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# FITTING OUT A WW1 SCALE COCKPIT

Grahame Wren shows how to add those all important scale touches to the instrument panel of a WW1 scout



Grahame's article in the September Issue on adding scale details to his SE5a generated a lot of interest, so we asked him to write another

**W**henver somebody looks at a model it's inevitable that sooner or later they will peer into the cockpit. What a disappointment to see a collection of servos and a rat's nest of multi-coloured ribbon cables. Or perhaps, even worse, an empty void!

For this article I'm assuming it's a scale model. But any model will be greatly enhanced by the addition of a few dials and switches. And a simple three-dimensional representation is always so much better than a flat photo stuck to the control panel. Whether it is to be a scale or a generic cockpit the construction is pretty much the same.

You may be lucky and find there is a commercial cockpit kit available. But to build from scratch is much more rewarding and, generally speaking, the materials are free from the 'scrap' box. Unfortunately some essential items that you'll need aren't so cheap - namely a computer with photo editing software and a printer!

So where to start? A photo of the full size aircraft cockpit is good. Also, get as many close-ups of the individual dials, etc. as you can find. I downloaded the photos for my SE5a from this website: <http://memorial.flight.free.fr/index.html>

Traplet Publications also offer a wide selection of 'Full Size Focus' CD's, which are a series of aircraft walkaround photo shoots that contain a selection of individual types of aircraft for reference, from vintage to classic warbirds, and home-builds. They also include cockpit shots and some of the pictures from the RAF SE5a G-EBIA disk (Order code: FF27) are used in this article.

Nearby is a general shot of the cockpit

of the full size aircraft. It can look a bit daunting, but the trick is to break it down into smaller sections and take it one section at a time. In fact in this case six of the instruments are basically the same, just different sizes and dial faces.

I'll start with the altimeter. Due to its position in the cockpit the photo isn't very good so it really demonstrates the 'repair' process that's invariably needed. The dial face appears oval because of the angle of the camera relative to the dial. There are bits obscured where the bezel and adjuster impinge on the image, and it is also partially covered by another instrument.



Instrument panel of G-EBIA



**Basic Computer Skills**

This isn't the time or place for a computer tutorial, but I used a combination of 'copy, paste and rotate' functions to replace the missing pieces, and 'distort' to make the dial as circular as I could. Note that the resulting image isn't just the dial face but also the mounting flange, complete with fixing screws.

All the numbers and lettering are deleted and re-done from scratch. To be more accurate, new numbers and lettering are positioned over the originals to ensure the size and orientation are near enough correct and then the original numbers are deleted. At the scale of my model (18%) this dial, which is one of the larger ones, required a 25 mm x 25 mm image printed onto glossy photo paper at 1200 dots per inch resolution.

After leaving plenty of drying time the printout is glued to thin ply and carefully trimmed to size. When doing the final shaping always sand away from the printout otherwise it is very easy to delaminate the photo paper. A cocktail stick and a blob of Blu-Tac makes a good holder for final sanding and whilst the edge is painted.



*Instruments are often photographed at an angle*



*But with a few photo editing commands the instrument can be 'flattened out' and made circular*



*A cocktail stick and a blob of Blu-Tac holds the instrument for sanding and whilst the edge is painted*



*The printout is glued to thin ply and carefully trimmed to size*

**With This Ring**

Next the bezel, for which we need an appropriately sized ring. I made this by cutting it from the spout of a bottle top that I'd saved in my 'that'll come in handy someday' box, into which I put anything and everything. At the time I rarely have any idea if they will eventually come in handy but they usually do! This is painted and stuck to acetate sheet using canopy glue. The bezel/acetate is then trimmed to size and glued in position on the dial, using a small bead of canopy glue under the bezel.

The picture shows a finished instrument. Unfortunately not the altimeter as I didn't take a photo before fitting it to the cockpit. But as I said earlier construction of all the instruments is basically the same. The addition of the bezel, in this case made from the colour coded identity ring from an electric toothbrush head (another 'that'll come in handy' item!) gives the instrument the required depth. The rest of the dials are made in a similar fashion. Two also have a balsa stand-off and the addition of copper or plastic 'pipes'.



*The bezel was made by cutting it from the spout of a bottle top*



*The finished instrument looks the part*



## SCALE COCKPIT

### Regulators And Selectors

Now onto the air pressure regulator and the air and petrol selectors, as they are a good example of why a photo is never really satisfactory. With more complicated pieces such as these I make a simplified sketch to help decide how much detail I need or can include.

The bits and pieces are collected. In the case of the regulator I needed some copper wire and brass tube to fit, three 14 BA nuts, a 2 mm fishing crimp (as used to make closed loops), a 2 mm nut and some 2 mm threaded rod, litho plate and some 1/8th square spruce.

The wood has crossed holes drilled through to suit the wire, then one hole is opened out to 2 mm. Three wires are fixed into position and the small tubes and 14 BA nuts are then soldered on. The 2 mm rod, nut and crimp are soldered together and fixed into the remaining hole using epoxy. When the glue has set the body is cut down and sanded to length with a Dremel before finally having a coat of silver paint and gluing to the back plate.

The air selector consists of two major parts: the dial and the lever. The first thing is to separate these. I do all the manipulation using Adobe Photoshop but I'm sure any photo editing software will do the job. There is an instant problem: some of the wording is missing, so failing more information I'll make an educated guess and I think it is reasonable to assume that it is 'FROM ENGINE & HAND PUMP'.

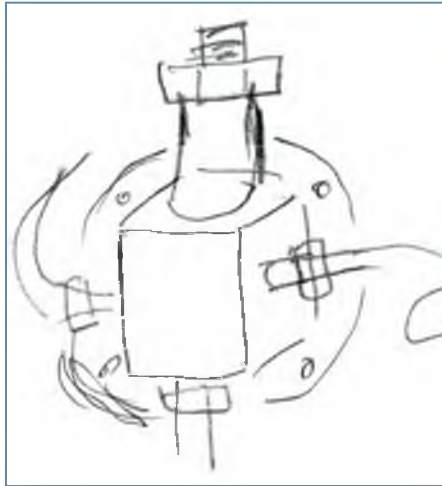
The dial is engraved aluminium and in the past I've used a simple grey printout. But it has never looked very realistic, so this time I tried a new method and the result is a reasonably convincing representation of metal. Good enough for me at least.

I changed the grey to white, which of course won't print. Then I realised that I'd 'lost' the dial and so I went back and made the background black before again changing the grey to white, except for the screws. I then reversed the image and printed it onto a transparency, as used for overhead projectors. When it was completely dry, I painted over the printing with silver paint.

Using the printout as a template, I made the lever from shim brass, a 2 mm washer and a dressmaker's pin for the knob (all painted silver). The spindle is a 14 BA bolt and a brass nut. The dial is glued to thin ply and the whole lot is assembled onto the backing, which is a simple disc of 1/8th balsa with some copper wire and brass tube.

The petrol selector is very similar to the air selector with regards to the computer work, except for the printout, which in this case was on glossy photo paper, not transparency.

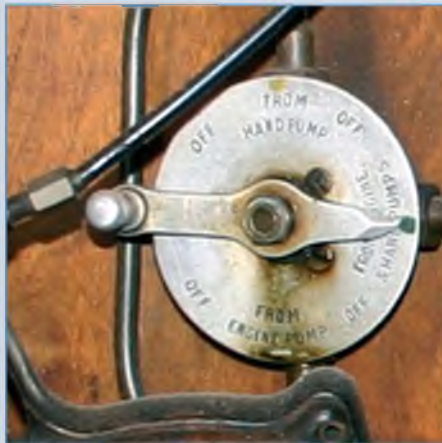
I converted my Dremel into a mini-lathe and used needle files to turn the knob, which is glued to a cocktail stick for easy handling whilst painting. It is also used as a pigot when gluing the selector to the control panel.



A simple sketch helps me to decide how much detail is needed



Air pressure regulator and the air and petrol selectors of the full size aircraft



Modelling the air pressure regulator



**The Other Half**

The other half of the control panel is pretty much a variation on the theme, with the exception of the identity plate, which is made by using the reverse printing on transparency technique as explained earlier but with 'brass' paint of course.

The hand pump, which having a brass body, presented a bit of a problem. Luckily for me, if not for some of God's edible creatures, my son is a shooter and a spent

.22 cartridge fitted the bill perfectly. As an added bonus it was already 'centre punched' by the firing pin! A stained wood handle and a pin complete the job. A different calibre cartridge forms the basis for the clock.

Although not easy to see in the photo, the oil pressure gauge has 'cracked glass'. This is just a scratch on the acetate, which I didn't notice until after gluing everything together. But I quite like it and I'm sure

there must have been many instruments damaged during WW1!

With the regulator, selectors and dials in position I think it becomes obvious why, in my opinion, a photo just doesn't do it. Viewed from different angles the shapes seen are completely different; shadows move and different parts are hidden from view.



The air selector consists of two major parts: the dial and the lever



The model's cockpit comes together

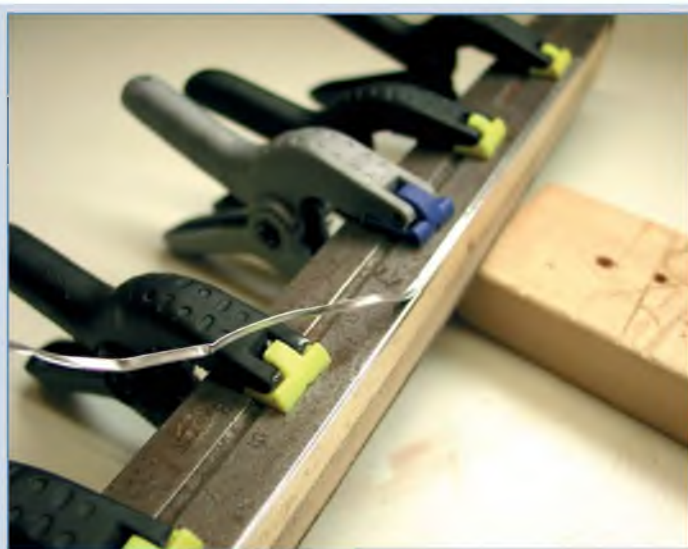
**Litho Plate**

Not all cockpit furniture is an instrument or control. The aluminium edging to the coaming is a very prominent feature on the SE5a and uses one of my favourite modelling materials - litho plate.

To form a consistent lip the litho plate is bent around the edge of a steel rule, then trimmed using a needle file angled at 45° to the corner.

The 'rivets' are embossed using a dressmaker's pattern tracing wheel. These are very useful things for producing evenly spaced lines of rivets; the spacing may not be correct but the teeth can be removed to make the spacing wider if required. They can be purchased from any local haberdashery department, which is a good source of many interesting little bits and pieces, so why not make good use of the time on that next shopping trip with the better half!

The edging is then shaped around the coaming, trimmed to size and turned under ready for gluing in place after the coaming is stained.



Making the cockpit coaming from litho plate



## SCALE COCKPIT

### Is It Worth It?

Scale modelling is always a balance between realism and a number of factors, including practicality, effort and, for a flying model, weight. Taking them in the reverse order:

- Most cockpits are located near to the C of G, so the small amount of additional weight doesn't have too great an effect. But, of course, always try to make things as light as practical.
- For me building isn't a chore so the effort of detailing the cockpit just increases the level of satisfaction in building a model.
- As for practicality, in this case the tipping point was the workings of the compass. My fingers are just too big and clumsy to model them at this scale so I resorted to a photo. Although I'm not entirely happy with the results it'll have to do!



*For me the effort of detailing the cockpit increases the level of satisfaction in building a model*

### Give It Some Stick

Of course, no cockpit is complete without a control column. The basic construction is simply various lengths of plastic and aluminium tube, and a plastic ring liberated from the wife's sewing box. The top tube is slotted to form the two yokes and faired into the ring with a mixture of epoxy and micro balloons.

In the background is my working sketch, with rough dimensions. The triggers are made from an old bean tin and are glued to a cocktail stick. Litho plate just wouldn't be strong enough; it would certainly fracture with the engine vibration.

The ring is bound with button thread and the top half covered with brown painted Solatex to simulate leather. The cocktail stick/trigger assembly is pushed down the tube and glued into position. And with the addition of a couple of control cables and a pivot it is ready for the cockpit.

There are numerous other bits and pieces in an SE5a cockpit - magneto, magneto switches, lighting switches, flares, throttle and bomb release etc. But to detail them all here would just about take up the entire magazine. Suffice it to say they were all made from scrap and various bits and pieces from the all-important 'that'll come

in handy someday' box. If you're interested full details can be found at:

[www.scale-models.co.uk/threads/se5a-construction-beginning-to.2417/](http://www.scale-models.co.uk/threads/se5a-construction-beginning-to.2417/)

I hope this article has provided you with some encouragement to equip your next model with at least some basic cockpit details. If you do I'm sure you'll find it quite addictive and once you've included one instrument you'll want to include more and more...

**RCMW**



*Full size control column*



*Modelling the control column, using a sketch as reference*



*Most cockpits are located near to the C of G so the additional weight of extra scale detailing doesn't have too great an effect*



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# GOLD FEVER

## IT'S CATCHING!

Peter Miller's semi-scale Formula 1 racer for .20 to .25 engines is fast, aerobatic and easy to build



Fuselage sides and formers being assembled over the plan

**G**old Fever, designed by Jim Harris, was a highly modified Cassutt Formula 1 air racer (although you would have trouble seeing any similarity) that first appeared at the world-famous Reno air races in 1987. I chose to model it because I always liked the tapered wings with inset ailerons and the early spat design. The colour scheme on my model version is nice and simple: yellow fuselage and white wings, with yellow ailerons and a blue number 25 and registration on the fin. In 1992, when the aircraft was called 'Dillusion', it sported an all-white colour scheme with a series of narrow stripes across the wingtip.

### Model Version

The model is not to perfect scale. The wings have been stretched a little, the ailerons are larger than scale and the fuselage is a little thinner. The changes make it more of a sports model and thus nicer to fly; however, it does retain the character of the original and fits in nicely with the other racers I have designed. I must add that it flies really well with a .20 engine and goes like a rocket on a .25.

### Construction Tips

The construction follows my normal methods and is easy and very strong. The wing construction makes sure that no

warps can creep in – follow the instructions and you will have a perfectly flat wing.

The engine cowl apple cheeks are quite easy to make. Note that there are no intakes on the apple cheeks: cooling air goes in under the spinner as on the full size aircraft.

### Fuselage

Start off by gluing the 1/32" ply doublers to the sides. I use impact adhesive for this. Don't forget the tail doublers at the same time. Prepare F-1 by adding the blind nuts now; trying to do that after the fuselage has been assembled is not a good idea. Join the sides over the plan view. Clamp at the

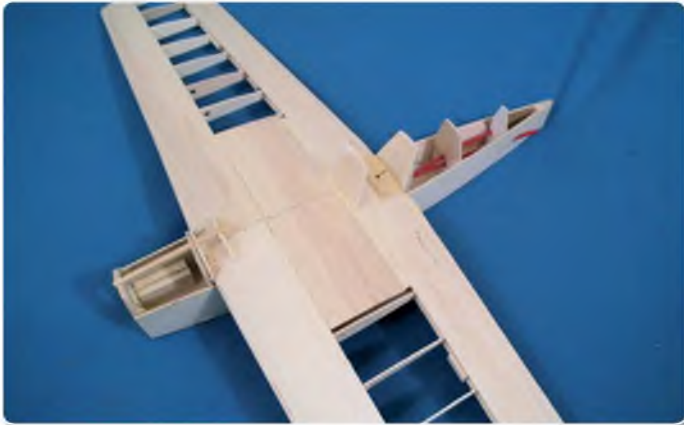




*Showing the undercarriage mounting inside the fuselage*



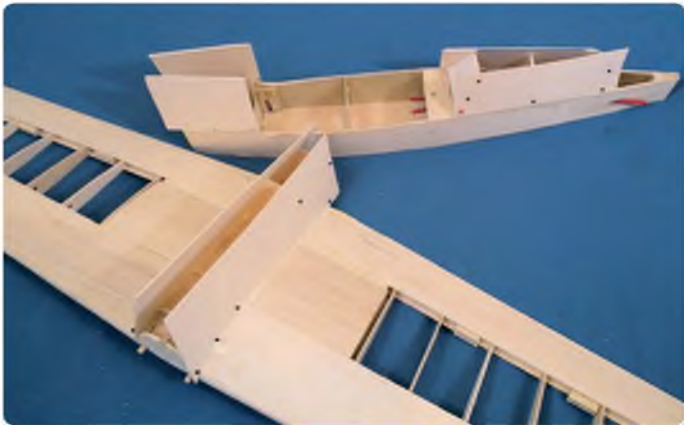
*View inside the tank bay showing the sheet where the silencer recess is carved out*



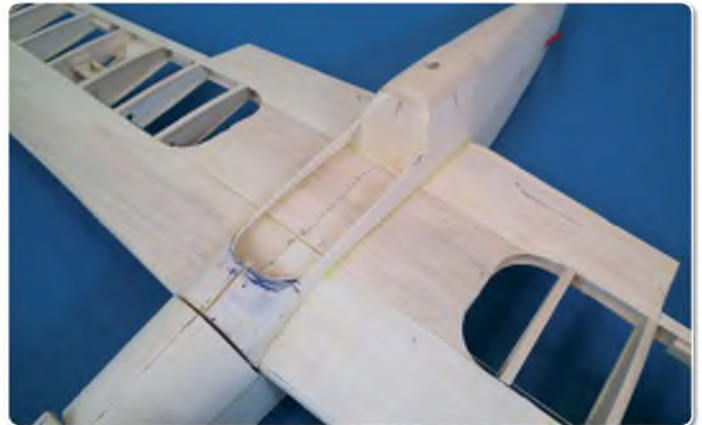
*With the wings fitted the rest of the formers can be fitted*



*Ready to start building the turtle decks*



*Glue the pieces of sheet to the sides and leave to dry*



*Close-up showing rough trimmed cockpit cut out*

rear with the triangular shaped infill and add the formers F-4, F-5, F-6 and leave the assembly to dry. Add the remaining formers with the fuselage still over the plan. You will need some good clamps to hold everything in place until the assembly dries.

Now fit the undercarriage mounting parts, which are cut from 1/4" ply. At the same time fit the pieces of 1/2" sheet that will form the recess for the silencer. Fit the snake outer tubes and cover the bottom of the fuselage with 1/16" sheet with the grain across the width. Make and fit the plate with the four UNC blind nuts for the wing hold down. 'Model Fixings' can supply these nuts and four UNC nylon cap head bolts. Using cap heads with an Allen key is much easier than trying to fiddle with a screwdriver down the hole.

For the next stage you will need the wings, so go to the wing instructions and build them. Adjust the two holes in F-2 for a perfect fit with the dowels in the wing

leading edge and bolt the wing down. Fit F-4b and F-4a, as well as F-2a, F-2b and F-3a. The spine between F1 and F-2b can also be added now. Leave everything to dry.

Remove the wing from the fuselage and then glue on the side pieces. Those that have to be bent over should just be glued standing upright. The ones for the rear of the fuselage can be glued to the formers.

Trim the cockpit area away roughly, making sure that you leave enough for final trimming. You only need to trim away enough to allow the front turtle deck to be shaped. To curve the balsa fuselage sheeting, first wet the outside of the sheet. Then, using a heat gun (or even a covering iron), apply heat while bending the sheet over to match the formers. Trim to meet in the middle and glue them down.

Once the turtle decks have dried trim them off flush with the formers and bolt the wing down again. Glue on the 1/2" sheet top deck and carve to shape the cut

through at the F-4a/F-4b joint. Make a hole for access to the wing bolt and remove the wing.

Mount the engine and glue the nose ring to the spinner backplate with 1/16" scrap balsa spacers. I use spots of CA for this. Next, build the cowl up between the nose ring and F-1 with 1/2" sheet and triangular stock. Once this has dried remove the engine and carve to shape. The apple cheeks are built up with 1/8" sheet formers and sides, and then a 1/4" sheet outer edge. Fit the wing and make up the small portions of the apple cheek that fit on top of the wing. The front of the apple cheeks are made from laminations of 1/2" sheet.

The fairing blocks each side of the fin are made by fitting scrap 1/4" sheet sacrificial pieces in place to the fin and tailplane, then fit 1/2" sheet blocks. These are all glued with a couple of small spots of CA. Carve to shape and the separate them with a knife blade. The spats are made from two





Stage one seen from engine side



Cowling carved to shape



Stage one of building the apple cheeks



Getting ready to make the fairing blocks on top of the wing



Tail fairing blocks being shaped



Fairing blocks separated from the sacrificial pieces

laminations of 1/2" sheet with one of 1/8" in the middle. If you have narrower wheels the 1/8" lamination can be left off. Carve to the plan view and glue on the 1/32" ply sides.

Finally, glue on the spat fronts from 1/2" sheet and shape to blend in. The spats are mounted by making up 1/32" brass saddles, which are soldered to the U/C legs. Matching plates have 3 mm bolts soldered to them. These are fitted inside the spats, the bolts protruding through the spat and saddle where they are held down with nuts.

Cut short lengths of 8 SWG brass tub, slide them through the outer spat side, and solder them to the axles to stop the wheels sliding off.

This completes the fuselage construction.

**The Wings**

The original aircraft had no dihedral and for the sake of simplicity I built the wings

flat on the board in one piece. This gives a flat bottom and just a hint of anhedral on the top surface. Following this construction sequence guarantees a warp free wing.

Pin the plans down and cover with a sheet of clear plastic. I save the backing film from Solarfilm. Now pin down the lower leading edge sheet and the lower trailing edge sheet. Next glue down the bottom main spar.

The ribs are glued down next and the rear of these locate the rear spar and the aileron leading edge. Then add the top main spar. Fit the 1/8" sheet leading edge and leave to dry. At the same time build up the rear spar in the aileron area to match the height of the ribs. Fit the short ribs in the centre section and fill in between the top and bottom spar with 1/4" sheet. The spar webs can also be fitted now.

The next stage is to bring up the lower leading edge sheet and glue it to the leading edge and the ribs. I use aliphatic

resin along the leading edge and hold the sheet in place with scrap trailing edge stock. Making sure that the sheet is in contact with the ribs, I run Superphatic along each rib.

Add all the assorted blocks and pieces of ply in the aileron areas, and the solid infill at the trailing edge at the root as shown on the plan. Shape all these down to match the ribs. Now you can sheet the top of the leading edge. Use aliphatic resin for this. I clamp the sheet down to the spar with clamps and clothes pegs, and use map pins to hold it down to the leading edge. The top trailing edge sheet can also be fitted now. Once dry the wing can be removed from the building board and the control system can be installed. Add the 1/8" sheet leading edge capstrip and shape the leading edge.

Fit the ply plate for the servo mounting and the bellcranks, and then install the bellcranks and push rods to the central





Basic parts for the spats



Spats completed and showing the mounting system



Wing construction. The lower leading edge sheet has to be raised and glued to the leading edge and ribs next



Close-up of the leading edge at the centre section



Blocks and ply plate in the aileron before adding top sheet



Top sheet being applied using lots of clamps and map pins

servo. Leave the pushrods disconnected at the centre.

Separate the ailerons from the wings and shape their leading edges. The centre section sheet and the capstrips are fitted next. Cover the underside of the bellcrank bays with 1/16" sheet and fit a piece of 1/32" ply to reinforce the slot where the aileron pushrod comes out. This pushrod can be fitted after covering if the slot is cut long enough.

The wingtips are laminated from 1/2" sheet and can be glued on and shaped when dry. Open up the holes for the wing dowels and fit these. I like to epoxy 1/4" brass tube into the holes and then fit the dowels with very small screws. This allows for easy replacement. Also, make and fit the ply plate that takes the bolt head. This must be packed up so that it is parallel with the nut plate in the fuselage. The wing can now be fitted to the fuselage so that the top decking can be added to it, as described in the fuselage section.

### Tail Surfaces And Covering

The tail parts are made from medium 1/4" sheet. If you prefer, you can use hard balsa, as the model will be slightly nose heavy anyway.

I covered the model with Solarfilm Supershrink Polyester. I prefer this material as it is less sensitive to an over-enthusiastic application of heat, plus it doesn't sag in the hot sun. If you prefer, other Solarfilm products can be used. I like these products as they tend to work well and are often lighter than other iron-on films.

I chose the colour scheme with a yellow fuselage and white wings. The numbers came from Humberstone signs on eBay. I added big black squares under the wings just to make sure that I know which way up the model is. After all it is small and aerobatic.

### Radio Installation

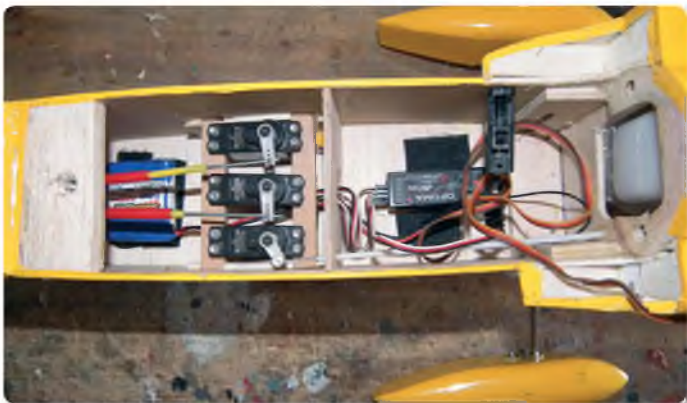
The fuselage provides lots of room for the radio. The battery is fitted just in front of F-4. I epoxy hook and loop to the bottom sheet using the sew-on type. I then use the stick-on type of Velcro adhered to the battery. I have found that self-adhesive hook and loop does not stick well to the usual skin of epoxy so I use the sew-on type for that part of the unit.

The three servos sit just behind F-3. There is plenty of room for the servos with no need to stagger the output arms. I used a Hitec Optima 7 Rx, which sits just in front of F-3 and is held down in the same way as the battery.

I used a 4 ounce Radio Active tank, set so that the wider dimension is vertical. The bung goes through the hole in F-1 where it is sealed with silicone rubber. The engine was an OS 25 FX, which is a mere seven grams heavier than my SC 25.

The finished model required an ounce of lead in the tail. I made the cockpit canopy





The radio bay has vast amounts of space. Note the battery at the rear and easy access to the fuel tank



Aileron bellcrank in the wing



Canopy pattern carved from balsa wood. Line the bottom and end with light ply as the shrinking bottle will crush the balsa



Gold Fever displays her clean lines



Close-up of motor installation



Simple colour scheme

by carving a pattern in balsa wood. This was wedged into a 2 litre plastic lemonade bottle, which was shrunk down with a heat gun to form the canopy. I have found that this simple technique works very well.

**Flying**

With the horrible spring weather – wind, gales and little sun – it took some time before I could get the model tested. But at last we got a weather window on a Bank Holiday Saturday.

Some people may feel that the tail surfaces are too small. Not a bit of it. The tail moment also looks small, but don't worry – she flies as if on rails.

With the OS 25 FX on song the model was released and there it was... gone! This model is fast - very fast. My friend, Stuart Pickett, flies my models while I take the pictures. I like to take the photos on the first flight, so I let him have first go. Once

the elevator trim had been sorted out Stuart was soon ready to make the passes for the camera. Soon I had the pictures and then Stuart started flying round at low level inverted and I got some shots. After the model was landed, I increased the aileron throws. It is surprising just how much throw is needed.

In spite of trying everything the model refused to bite. Spin recovery is instant and when throttling back and holding in full up elevator the model will not stall or drop a wing. Consecutive loops are simple, with no tendency to screw out. The same applies to outside loops. I also put her into a tight turn and ended up flying circles at speed of about 10 foot diameter circles in a vertical bank.

My two favourite manoeuvres are the Avalanche, a loop with a flick roll at the top, and four point or hesitation rolls. She does these with ease. I also like doing a

vertical climb and giving full down, full right rudder, full left aileron and full power. At this point the model tries to tie itself into a knot – a lot of fun!

Landings are great. Even dead stick the glide is long and flat, but the spats don't like the grass so maybe the wheels are not free enough. Some of the flying shots show the spats out of alignment. A quick yank on the U/C legs cures that.

**Summary**

Gold Fever is a compact and fast aerobatic model that will not bite you. Plus, she's small enough to fit in most cars in one piece. Since building Gold Fever I have made myself a promise: the next racer that I design will not have spats or apple cheeks. Yes, there are a few designs like that!

**RCMW**





*Inverted needs a little down elevator. Otherwise Gold Fever is very easy to fly*



*In flight those clean lines lead to good performance*



*Black squares on the underside of each wing help with orientation of this speedy model*



*Spats don't like grass very much. A quick bend and they are straight and ready to go*

## MODEL WORLD DETAILS

### MODEL INFORMATION

**NAME:** Gold Fever  
**MODEL TYPE:** 1/6th semi-scale Formula 1 air racer  
**WINGSPAN:** 48" (1219 cm)  
**LENGTH:** 34" (863 mm)  
**WING AREA:** 440 sq in (2838 sq cm)  
**FLYING WEIGHT:** 57 oz (1653 gm)  
**WING LOADING:** 18.65 oz/sq ft (58 g/sq dm)

**CONSTRUCTION:** Balsa/ply/spruce  
**COVERING MATERIAL:** Solarfilm Supershrink Polyester  
**CENTRE OF GRAVITY:** 2.75" (70 mm) from Leading Edge

**CONTROL THROWS:**  
 Ailerons: Low rates 3/8 (10 mm)  
 High rates 5/8 (15 mm)  
 Elevator: 5/16 each way (8 mm)  
 Rudder: 5/8 (15 mm)

### IC POWER

**ENGINE RANGE:** 20 - .25 cu in (3.5 - 4 cc)  
**ENGINE USED:** OS 25 FX  
**PROP:** Master 9" x 6"

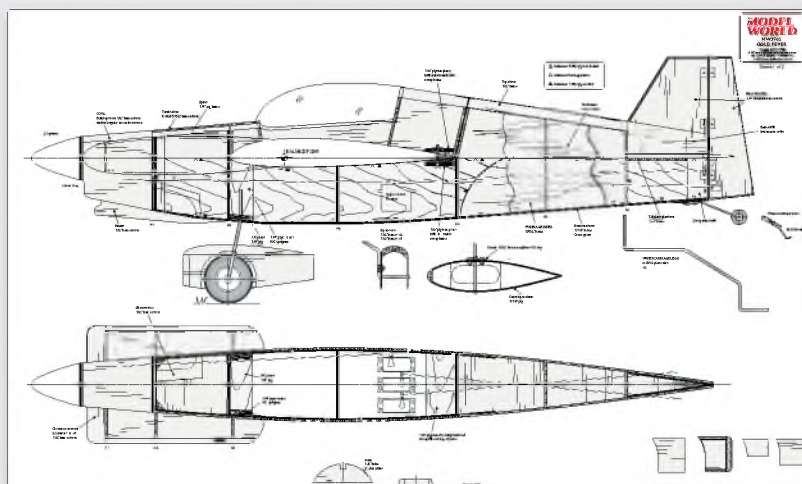
### R/C FUNCTIONS

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

## PLAN DETAILS

**NAME:** Gold Fever  
**BUILD CATEGORY:** Intermediate  
**PLAN NUMBER:** MW3762  
**PLAN PRICE:** £13.99 (\$23.99)

Plans and parts (if available) are subject to Postage and Packing charges at standard rates. Copies of plan number MW3762 are available from RC Model World (Plans Service), Traplet Publications Limited, Traplet House, Willow End Park, Blackmore Park Road, Welland, WR13 6NN, England, Telephone: + 44 (0) 1684 588599, Fax: + 44 (0) 1684 578558, Email: orders@traplet.com or order online at www.trapletshop.com For more information on the Traplet Publications Plans Service see our advertisement in this issue.





*A rogue Robin Hood cannot stop the action at the 2015 York Electric Fly-In. Bruce Corfe reports*



*Paul McLean plus his Phoenix Rainbow with one corner of the Wilberfoss field and 'Paul (Lewis)'s Tree' on the right!*

# YORK

# ELECTRIC FLY-IN 2015



*YMAS officials hard at work in the pop-up hangar. Lots of lovely models*



*Paul Lewis's magnificent Freewing Boeing B17 from (Hobby King) – Paul didn't maiden it on the day, more's the pity*

This was the second year the York Model Aircraft Society used the Wilberfoss Sports Ground site (about 15 miles south-east of York) for their annual Electric Fly-In, after being ejected from Knavesmire Race Course by the Tour de France last year. The mown sports field, surrounded by 'magnetic' trees and already on the tight side, was further compromised this year by the presence of a lone William Tell with a bow and arrow and two large targets, alarmingly sighted in line with the runway! Where were Health & Safety? 'Mr. Tell' wouldn't budge but actually seemed to be watching the flying more than notching his quills.

Anyway the weather was calm and warm if cloudy, the threatened rain stayed away for the duration of my visit and the selection of models in the pits was mouth-watering! Action!

Mike Cawood's 'E-Fair' glider came from a sale at the BMFA Nats. Designed for a brushed Speed 400, Mike added a brushless in-runner for a great performance boost and 20 minute-plus flights in lift on a 20 A ESC and 1800 mAh 2S LiPos. Mike's second model on the day was a Bel-Air 'Simplex' built-up old-timer (one of the highlights of the day for me) – needing nose weight to add to the 2822 bell motor up front, Mike found that 8 pound coins worked perfectly, but saving money (remember it's Yorkshire!) he has built a replica diesel engine out of a stack of 1p and 2p coins bolted together!

He flooded the top with epoxy to form a domed cylinder head, and to hide the Queen's portrait – he agreed with me that this was probably a treasonable offence! The model runs on a BRC 15 A speedo and 1300 2S LiPos.

Flying mate Ted Remmer – we fly from the WW2 aerodrome at Wombledon, N Yorks – brought a boot-full of models. His Aerovan twin from a magazine plan originally flew on faithful old Speed 400s and 7-cells, but now sports two cheap brushless motors on a 3900 2S LiPo and flies extremely well.

Ted told me that on the original set-up he did a (very) low pass down the tarmac and didn't understand why he lost control on pulling up, with some serious damage resulting. An onlooker said, "You do realise you lost a prop – it touched the runway?" F.Y.I., those Günther prop-blades are 2.5 inches long... Ted also brought an EP Magnatilla and a swept-wing 'Thing' created around the wing from an old I/C sports model.

Paul Lewis's Wot 4 Foam-E was indistinguishable at a few yards from a





*I blame nerves for the quality of this shot of the Lone Archer aiming for the flight line. Luckily, he was a lousy shot too*



*Tony Oliver with his 22" own-design Depron pusher-prop Gloster Javelin – great little flyer (nearly said "so's the model" – Cheers Tony and thanks for all the info!)*



*Dave Langley's Ultimate is a great performer in the air – terrific one-piece aerobat for the back of the car*



*Dave Langley's E-flite Ultimate 20-300 biplane, standard set-up but with a Turnigy outrunner*



*Tony Oliver's Lightning also runs a rewind 10 g outrunner, 10 A ESC and 800 mAh 2S LiPos, as does his Javelin*



*Poor Barry Hurst rescues his broken and smoking model from 'Barry's Tree'*



*Barry Hurst's large E-flite Extra – damage was more or less limited to the loss of the wing and is repairable. The model runs a Turnigy G45 motor and 70 A ESC on 4S LiPos*



*A reminder that 5000 mAh LiPos don't fare well in crashes – lots of smoke but no fire, luckily. The battery hit the back of the motor in the crash*

built-up example also present. The Foam-E was the first casualty of the day, ending in what is now 'Paul's Tree', luckily with negligible damage. Paul's magnificent Freewing Boeing B17 from Hobby King just required the addition of a battery and Rx, but was destined not to make its maiden flight at the show. It looked great on the ground, though. Paul's big Pegasus glider reached spectacular heights in quick time and stayed there thermalling for ages.

Ray Smith flew a Dave Smith Models Panther fun-fly, inherited as a partially built kit and converted from the intended I/C motor to a Pulso 28-26 1130 KV out-runner. This is a big model and was probably designed for a .46 2-stroke or similar. It flew brilliantly on the brushless set-up with two parallel 2200 3S LiPos giving extra duration. Paul McLean's venerable yellow and blue

Rainbow old-timer is a built-up balsa ARTF from Phoenix Kits and is a good-looking model. It flies a treat on a 2200 3S battery.

Barry Hurst flew his slinky black Hobby King Tricopter with skill on three 28/32 motors and an HK control board but then became casualty no. 2 when his large E-flite Extra 300 hit a (different) tree on approach with a resounding 'crack'. Damage was more or less limited to the removal of one wing but the big LiPo shot forward and sustained considerable damage on hitting the rear of the motor. This resulted in something of a spectacle as the model, still up the tree with Barry jumping up and down under it, started emitting clouds of smoke! A reminder that LiPos don't fare well in crashes! Barry hopes to repair the model which uses a Turnigy G45 motor and 70 A ESC on 5000 mAh 4S LiPos.

**Lots of Jets!**

Tony Oliver brought a bunch of models. His 22" O/D Depron pusher-prop Gloster Javelin was first off, and the little scale model flew very well. Tony has plans available, drawn from enlarged 3-views. It was very stable despite having no dihedral – Tony explained to me the aerodynamics of how the sweepback gives stability. The model has a 'rewound cheapo 10 g outrunner', 10 A ESC and 800 mAh 2S LiPos. Tony's scale Lightning used the same kit and flew almost as well as the Javelin.

The bright orange Multiplex Funjet also belonged to Tony Oliver. With a 400 W Keda motor on 3S 2200 mAh LiPos and a 5" x 5" prop, the little foamy has been clocked at 119 mph (Tony tells me that the speed was measured by filming a video and using software to analyse the Doppler





*Dave Langley's big yellow Sukhoi Su-26m, minus its canopy which blew off in flight. Great aerobatic ship*



*Ted Remmer's Aerovan twin from a magazine plan sports two cheap brushless motors on a 3900 2S LiPo and flies extremely well*



*Built-up twin-boom pusher Pushy Cat 'prop-jet' from Dave Sanderson – great performer, re-engined from brushed to brushless power*



*Mike Cawood's Bel-Air 'Simplex' old-timer – stately performer on a brushless 2822 bell-motor*



*Sandy's Parkzone Habu ready for the off on its bungee ramp, sporting USAF Thunderbirds livery*



*Tony Oliver's Multiplex Funjet has a 400W Keda motor on 3S 2200 mAh LiPos and a 5" x 5" prop – it goes like stink!*



*The Habu has the optional retracts which handle grass landings well but it prefers the bungee for take-off*

effect on the soundtrack. Clever or what?). The finish was achieved by sanding and acrylic spray.

Tony's nephew, Jason Rigg, flew his standard Multiplex Fun Cub energetically, and the oversize balloon wheels suited the grass strip perfectly. It uses the popular-sized 2200 3S LiPos.

There were a number of other jet-type models present. In addition to Tony Oliver's Funjet, YMAS member Dave Sanderson brought a Pushy Cat – a built-up twin-boom pusher 'prop-jet' from a plan originating in A.N. Other place. Sandy's model goes like stink and looks great in the air. I think it, too, has been re-motored from brushed days. It went

totally vertical from Ray Smith's hand launch (intentional I'm sure).

In looking up the model on Google I discovered several things including the fact that it is loosely based on the only pusher craft to win the Reno F1 Air Races, and for those who like me find less time for building than flying (as I may have mentioned before, the trouble with being retired is you never get a day off...) Hobby King have a built-up version available at a reasonable price.

Sandy's other jet, an F16 look-alike, is in fact a very nice foam Habu from Parkzone. He has added the optional retracts to the standard set-up and always launches from a bungee and ramp to good effect. The

model screams around the sky at great speed in a fairly noisy manner but slows down nicely for a wheels-down landing in the grass.

Dave Langley has self-launched his Vampire many times at the club field, but in front of a crowd it went horribly wrong and cart-wheeled in: casualty number three. Dave was back in the air in minutes with his E-flite Ultimate 20-300 biplane, standard set-up but with a more cost-effective option than the specified E-flite motor. Casualty three-and-a-half occurred when the large cockpit and hatch cover from Dave's big yellow Sukhoi Su-26m blew off – a search party had not recovered it when I left.





*Paul Lewis's Pegasus glider reached crazy heights and thermalled for ages*



*Jason Rigg flew this Multiplex Fun Cub on 2200 3S LiPos – the big wheels work very well*



*Ray Smith's big Dave Smith (no relation) Panther fun-fly – goes a treat on a Pulso 28-26 1130 KV out-runner*



*This Hobby King Tri-copter was flown by Barry Hurst – Barry had great control of the futuristic looking craft and flew many close-in circuits and figure-eights*



*I couldn't resist including this shot from the last YMAS fly-in at Knavesmire Racecourse. Perfect follow-through from Ray Smith dispatching Dave Langley's ill-fated EDF 'Vampire'!*



*Not that you'd know it! This is Mike Cawood's nose-weight in the form of a 'diesel motor' made from laminated 1p and 2p coins! Top job!*

**Conclusion**

Final words from Club Chairman Jon Edison: "Well, we had Paul crashing into the tree-tops on the right, Dave losing his canopy over the corn field on the left, and Barry hitting a bush and setting his LiPos on fire! The odd arrow flying past from time to time, not the Red Arrows, but wooden ones from the archery bloke, who set up camp at the far corner, despite being told we had booked the field!

We ran our usual 'one model' gliding comp at the end of the day, which we had to cut short as a humungous thunderstorm headed our way. Fortunately, we had just managed to clear everything off the field when it hit us. Visibility caused by the

downpour was so bad that many motorists pulled off the road on the main route back to York to wait for the storm to pass.

But apart from that, a quiet day really! Another successful fly-in at the Wilberfoss playing field.

This is the second year we have been here, brought back by the well-kept sports field and the terrific pavilion providing a range of cooked food together with the all-important washroom facilities. The perfect weather conditions throughout most of the day and the great facilities provided here have ensured we will be back in 2016!"

**RCMW**



*The Aerovan had a rebuild and makeover after a brush with the Wombleton tarmac – see text*



# MESSERSCHMITT BF 109E

If you've built Adrian Britton's Spitfire, which was the free plan in our R/C Warbirds Special (first published in 2011, but still available) here is its classic opponent!



**T**he Messerschmitt Bf 109 had smaller wings than the Supermarine Spitfire. I would have liked to have produced it to the same scale, but this would have been impractical. At only about 24" span it would have had too high a wing loading for my piloting skills to cope with! So, here it is, a 28" span opponent for our previous free plan! In the sky the difference in scale is imperceptible.

## Build Emil

Build a complete wing first. Start by looking at all the relevant pictures and areas of the plan. Prepare the 1/32" bottom sheeting from the patterns. Butt-join using the 'tape together and glue' method. Pin and glue the 3/32" square lower spars exactly in position, using a rib as a guide. Pack up under the LE and fit all the ribs. The R1 ribs must be set at the correct angle using the template. Chamfer along the edge of a length of 3/32" x 1/4" balsa and fit it as the primary LE. Add the top spar. Pack up under the trailing edges towards the tip a little. This will assist when setting the washout later. Add the top LE 1/32" sheeting, but only the forward panel up to the middle of the top spar. Carefully cut 1/32" strips vertically down to the bottom sheeting, against the spars, to the R1 ribs. Join the wing panels with the 1/32" ply brace. Use the washout/dihedral jig when joining the wings. With the roots aligned by pinning down, add the servo tray. Tack in a scrap brace to the rear to keep things square while completing the wing structure. Follow the plan sketches, regarding the aileron and sheeting stages. The final result should be zero incidence at the tip rib position (in line with the tailplane). Make sure of this before finally gluing the wing in place.



Wing construction



Aileron servo and linkage



### Fuselage

Construct the fuselage crutch frame, add the formers from Number 1 onwards, the 1/16" sides (note that the tops of these butt-up against the bottom of the crutch, becoming flush with the fuselage sides). Add the tailplane mounts and the 3/32" square spines. Make-up the 1/32" sheet rolled motor tube and fit with the correct thrust lines. Stick the little 400 in to help you here. Add the laminated nose block so that the motor will slide in and out as needed. Shaping up can be left for later after planking. Just get that shaft pointing out of the right place!

### Tailplane

Construct the tailplane and elevator assembly. This bit is straightforward enough on the plan, where the job is a simple 1/16" balsa lamination. Now, as with the Spitfire, I went a little overboard and built these up using a 1/32" base, with 3/32" for the top, and the elevators made up with a 3/32" scale shaped LE and 1/32" strip for the ribs.

Anyway, sand, tissue and dope it. Make up an over length pushrod from stiff 1/8" square balsa and with the 20 g wire connector bound to it, then locate it in the elevator horn. The idea here is to pass the assembly down through the fuselage later on when the wing is attached, fitting it with the control hidden. This bit was tricky on the 109, so don't rush it and read on. Leave the other end of the rod over length until the final assembly with the servo in place. We can't afford the weight penalty of hardwoods and adjustable linkages etc.

### Finishing Off

Get the fitting of the wing and tail organised and aligned. Fit and set up the aileron servo and connecting rods. Operate them and pre-adjust to get about 5/16" up and as little as possible down.

Now glue the wing in position. Slip the elevator pushrod (with the tail hanging on the other end) down through the fuselage; remove the crutch cross members carefully where they interfere. Then attach the tail assembly. Install the elevator servo and set it up to achieve a maximum movement of 5/16" up and down. Even at this size (like the Spitfire) Bf 109s are notoriously elevator sensitive! A drinking straw aerial tube can be inserted as well.

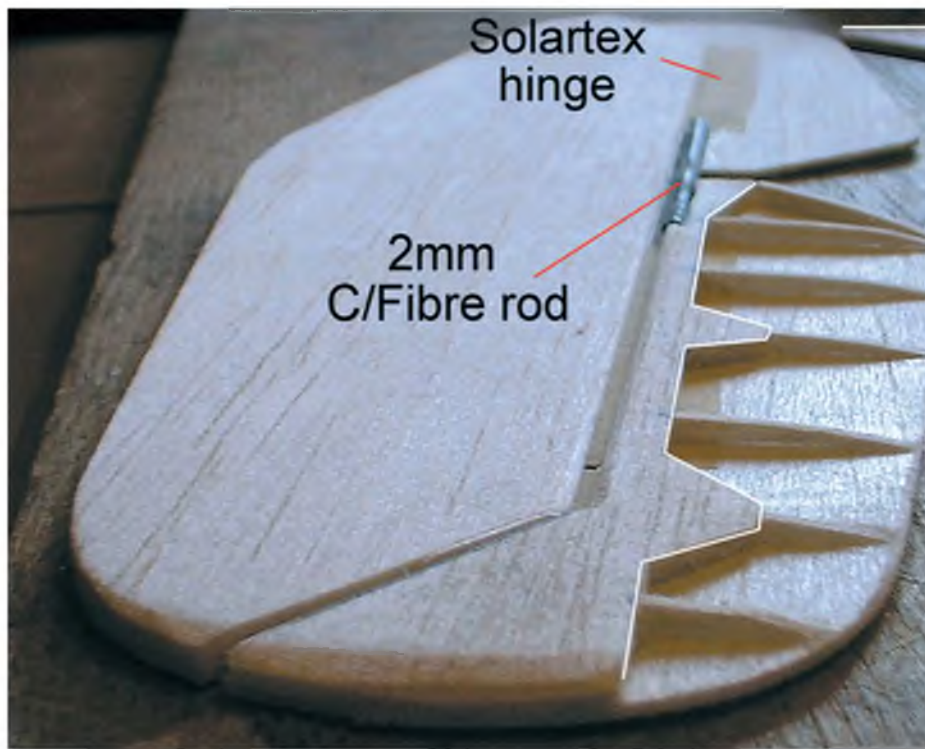
Add the sheeting and planking, make up and fit the fin and rudder. I didn't make the rudder work this time, as on the Spit. It doesn't really need it but it's up to you. Make up filleting from 1/32" sheet. Sand everything to perfection. Dope, sand again and cover with light Jap type tissue, doped on. Add your exhausts, guns, aerial mast etc. Lightly airbrush or paint the model and add the insignia of your choice.

I made a cockpit canopy by heat shrinking the centre section of a pop bottle around a plug, packed in tight. For the framework sticky backed peel-off label paper was cut into 1 mm strips, then painted, peeled off and stuck on to the canopy moulding. The canopy is only glued on to the removable section of the fuselage.

If you are going to detail the tail feathers



Aileron servo in place



Tailplane construction

and connect up rudder etc. do bear in mind that built-in lightness is essential on an electric aeroplane. Also, many model warbirds are prone to tail heaviness. I only got away with it by virtually butchering the inside rear fuselage! I also made no attempt to keep anything up front down to a weight following this. I don't have the skills for airbrushing, which would probably look far better at this size.

### Flying

Fly your Bf 109 in a maximum wind speed of 10 knots. My model turned out at 12 oz, which is about right for the loading. I'm sure some readers could better this. The C of G must be well forward of where you would expect (as shown on the plan), but you may be able to play with this as you go. I rolled and looped it and all that. It flew easy and smooth.

Then came the bit that was fun! I had treated myself to another transmitter, so with the help of one of my friends I was able to set up both the Spitfire and the Bf 109 for an encounter! A vicious and spectacular 'Battle of Britain' followed in near silence over the pastures of Marshfield.



Laying down the fuselage crutch





Fuselage formers in place



Planking the fuselage

After some fun action the 'Merlin' in the Spitfire began to rotate in its hole, pulling the spinner onto the nose. Don't let this happen to you - sand away some of the balsa tube and get a tight enough fit! The Spit was skillfully put down on the soft grass, wheels up, whilst the 109 pilot executed a dangerously low pass, at metric speed, over the downed adversary. He gunned his Daimler Benz 400, climbing away into a victory roll...

**Right - Now Fly Yours!**

The 650 mAh 9.6 v AAA metal hydride packs from Overlander give plenty of constant power and flying time, so there's no need to go for height or rush straight into aerobatics from launch. However, with their 720 mAh pack that I tried in the Spitfire, even though it's about 1/4" longer and 1/2 oz heavier, the performance jumps a big stride. It accelerates into a loop from level and the 10 minute show off at a show slot is practically guaranteed! A well built Me 109 would be able to carry this pack.

With everything as per plan and centred controls, have the model launched level, without too much effort, with full power on. The model should accelerate strongly and climb. You should now need to back off the power a fair amount, trim it out and stooage around.

It goes fast enough to easily hold its own with the big boys if you want, but don't let it get too far away from you. Shut down the power at the tops of loops and when diving. The ailerons are a bit more sensitive than the Spitfire. The roll rate is, well, impressive! Avoid too tight full throttle turns at low altitude. I haven't had a high speed stall yet with the Bf 109 but a model of this size will do it, I have no doubt!

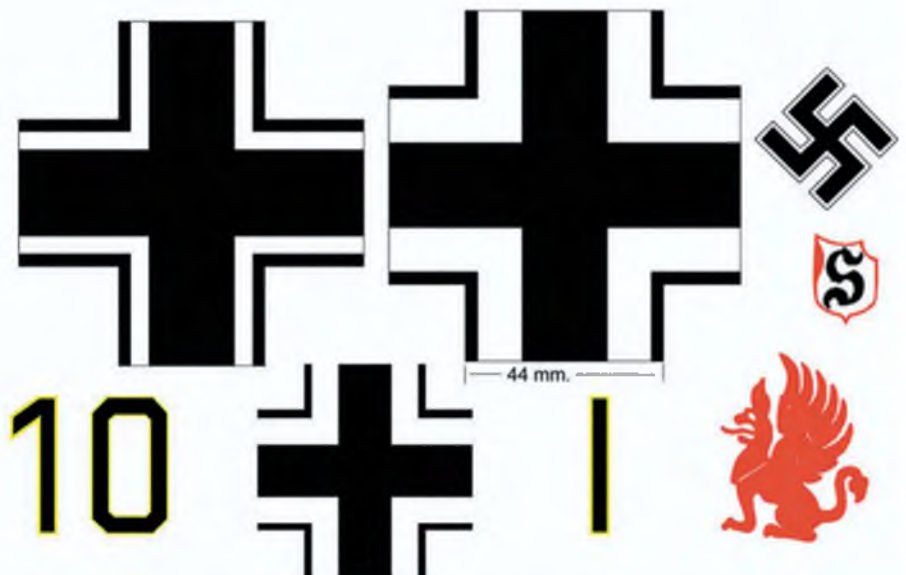
To bring the Messerschmitt in allow the model to descend on throttle control all the way until kissing point, then shut down and flare. Don't try to stall it in.

Right, that's it. All the best to those who dare again!

**RCMW**



Tail decoration



Luftwaffe insignia used on the prototype model





The airframe before decoration



Nearly finished – just the canopy framework to complete



Alternative NiMH batteries, as supplied by Overlander

**THE MODEL WORLD**

**DETAILS**

**MODEL SPECIFICATION**

- WINGSPAN:** 28" (711 mm)
- WEIGHT:** 12 oz (340 g)
- RADIO FUNCTIONS:** Throttle, Ailerons, Elevator
- SERVOs:** Supertec NARO
- BASIC CONSTRUCTION**
- MATERIALS:** Balsa, Ply
- COVERING MATERIAL:** Tissue and dope
- CONTROL THROWS:**
- AILERONS:** 5/16" up and as little as possible down
- ELEVATOR:** 5/16" up and down

**ELECTRIC POWER**

- MOTOR:** Speed 400, 6 v
- PROP:** Kavan 6" x 4" cut down to 5.½" and balanced or Günther 5" x 4.5"
- ESC:** Ripmax Extra12
- BATTERY:** 8 cell AAA 650 mAh NiMH

**PLAN DETAILS**

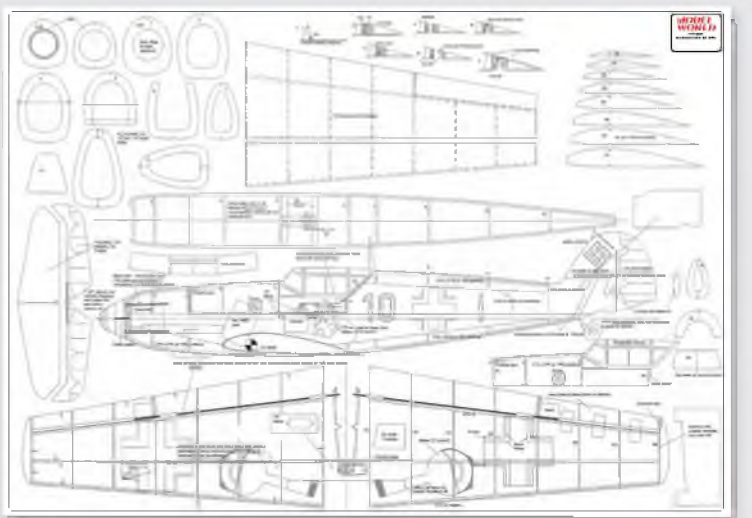
- NAME:** Messerschmitt Bf 109E
- BUILD CATEGORY:** Intermediate
- PLAN NUMBER:** MW3047
- PLAN PRICE:** £11.99 (\$20.99)
- WOOD PACK NUMBER:** WP3047
- WOOD PACK PRICE:** £31.00

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# F3A AEROBATICS AT THE NATS

*Matt Hoyland reports from the precision aerobatic flight line at the BMFA Power Nationals*



*FAI P15 and F15 and overall F3A BMFA Nationals Champion, Matt Hoyland and his Oxai Citrin biplane*

The title of F3A British National Champion and the SMAE Radio Control Trophy was contested by seven pilots over the August Bank Holiday weekend. The SMAE Radio Control trophy was first awarded in 1949, with many famous names adorning the trophy such as Ken Binks and Terry Westrop. Three previous winners were in attendance this year, Kevin Caton, Brandon Ransley and I, Matt Hoyland, as the current holder.

Two-time winner Kevin Caton first won the trophy back in 1996, and then again in 1998. Also returning to the fold after a few years sabbatical was Brandon Ransley, a four-time winner and most recently taking the title in 2010. Kevin, Brandon and I were joined in the top class by Steve Underwood, Adrian Mansell, Gerhard Fehringer and Arthur Silsby.

All pilots were flying electric models this year using either the Hacker C50 13XL or the Q80 out runner motor on either a 2-blade or 3-blade propeller, all powered with 10-cell lithium polymer batteries. The field was equally split between biplanes and monoplanes, with the Oxai Citrin being the biplane of choice for Arthur, Kevin and I. Adrian Mansell was flying his own design Boson with new wings for 2015 and a throttle activated brake on the caniliser to slow the model on the downlines.



*Steve Underwood flew his Spark Evo hybrid, powered by a Hacker C50-13XL energised from 5000 mAh Overlander Fullymax LiPo's*



*Adrian Mansell continues to evolve his own design Boson, now equipped with a new set of wings and a throttle activated brake on the caniliser*



**Four Round Decider**

Six rounds were planned for the weekend: four rounds of the P-15 schedule and two rounds of the harder F-15 schedule. Unfortunately the weather curtailed events late on Sunday evening with the four P-15 rounds having been completed. I managed to hold onto the title to take my second BMFA Nationals title, winning three of the four rounds. Steve Underwood finished second, winning the fourth round and pipping Adrian Mansell by three points, who placed third.

Kevin was fourth, followed by Brandon, Gerhard and Arthur.

**Champions All**

The GBR/CAA, who run the event on behalf of the BMFA, also award a Nationals Champion crown to those pilots flying the Preliminary Only, Masters, Intermediate and Clubman schedules, where Clubman is aimed at beginners to our sport where anybody with a B certificate is capable of flying 11 basic manoeuvres. The P Only trophy is for those pilots who do not want

to fly the more difficult finals schedule and is always hotly contested. Peter Scoles prevailed this year, winning three of the four rounds, with Adrian Harrison in second place and Brian Hoare in third. Lee Backrath won Masters, Ian Mould won Intermediate and Graeme Jones won Clubman.

For more information on F3A and precision aerobatics in the UK please visit: [www.gbrcaa.org](http://www.gbrcaa.org)

**RCMW**



Our cover star this month, Kevin Caton with his Citrin bipe. Hacker Q80-14XS in the nose, fitted with a 3-blade PT 20 x 13 prop



It was good to see four times F3A Nats Champion Brandon Ransley flying again at Barkston. Brandon flew his 8-year old Oxalys in his first competition since 2011



Gerhard Fehring was contesting the P&F schedules for the first time this season. It is also his first season flying the Oxai Galaktik. Small curved tips on the Ulsamer 21" x 14" prop help with battery consumption



Isle of Man resident Arthur Silsby was another to favour the Oxai Citrin. Arthur's model is powered by a Q80-14 XS, fitted with a 21" x 13.5" Falcon carbon prop



First place in GBR/CAA Intermediate Schedule went to Ian Mould, with Mark Allen finishing second




Lee Backrath was top of FAI A16 GBR/CAA Masters



FAI P15 Schedule was won by Peter Scoles





Big Red, the 2.5 metre Senior Telemaster I use to ease my apprentices into flight without fright. It's totally predictable

Dave Goodenough recalls a near drone disaster

# QUADCOPTER QUANDRY



Yann preparing his quadcopter for another sortie over the army camp Badlands. A telemetry 'glitch' found the beastie nesting on high later in the day

Of all the latest developments in model aviation, one seems to have literally 'taken off' with an enormous following, almost from day one. Drones (or more accurately Quadcopters, and their expensive cousins, Hexa- and Octa-copters) are seemingly everywhere now, priced down to a point where the things are almost being given away with cereal packets!



Time to bring the Pilatus home to watch the autonomous quadcopter's wayward adventure. The PC-6's long, sprung legs soak up the bounces and make even my dodgy arrivals look good

Our neck-of-the-woods in the badlands of the Breton Broceliande have been infested with them and no amount of swatting and disinfection can get rid of the devilish things. Despite the downside of these devices being flown irresponsibly by a few dimwits, most local multi-copter pilots appear to be taking the safe route and keeping to our club's training system. One guy is, however, far beyond such constraints; Yann Dobignard – Breton to the core – has been manipulating the whining beasts for several years and has built up an enormous depth of both knowledge and skill in the operation of hovering oddities whilst using FPV (First Person View) equipment. Unfortunately, his skill and wisdom comes to naught in certain situations...

## 'Ete Anglais'

That's English Summer to you, non-Gallic types. It's the French joke that's used to describe our piste weather in winter: a cold lazy 'Norfolk' wind that cuts through, not round, all the hardy types that dare to brave the tarmac up on the windy ridge that we call home. Hardy types? That'll be the Brits, all three of us, dressed for the

weather and trying to fire up our engines with glove-clad frigid fingers whilst the rest of the French flyers are down in the army camp gymnas, warm and weatherless, playing with their indoor marvels. Only local chap Yann braved the cold, complete with his 'all singing and dancing' FPV quadcopter.

This is no ordinary 'toy' but the development of something a little special. Yann has built his own transmitter 'station' with 'fly-by-wire' aircraft type controls, but is also developing a form of autopilot that is able to perform pre-programmed tasks and fly autonomously should the transmitter signal be lost. Thankfully, as a club member he has dispensation to use the autonomous function over military terrain at heights and distances far greater than the limits the authorities place upon us ordinary mortals.

To pre-test the system, Yann used his little winged drone – a simple, small 'off the shelf' flying wing, fitted with his gizmos. It was more than a little disconcerting to watch him switch on the drone, then launch it 'dead', with the propeller stilled, whereupon it sensed the acceleration and fired up while he turned his back on it





Almost back! Our very own 'Orange Utang', Yann reaches the thinning lower branches after his aerial and arboreal odyssey. Those lowest stumps are the most risky



Back on 'Terra very Firma' after his struggle, Yann gives me the 'salute' after rescuing his favourite 'toy'

and walked away... Hang on though - no transmitter, no FPV glasses and no worries it seems - what's happening?

The little beastie climbed to its pre-set height, turned right into a circuit, followed the line of the runway down to La Ville Bizzard (the army training mock village) at around 1 km distance, before banking again perfectly and cruising back to the pits. Once returned, the power ramped down and the little plane alighted almost at Yann's feet, out at the pilots' position and alongside the runway - incredible!

With the system 'proved', the quadcopter was now readied for an FPV test flight, with the auto-return ability switched on, should the signal be lost and the device enter fail-safe mode.

### Ô Ma Mère - Aidez-Moi!

With screen specs on his head and controls to hand, the quadcopter was eased skywards and into a circuit away from us barmy Brits. It's curious to see a chap leaning up against one of the pit-side benches seemingly doing nothing more than twitching his hands, but with FPV it usually is really that simple.

I brought my 'Painted Pilatus' (my horrendously bright VQ ARTF model) back to the pits, cut the SC .52 four-stroke and switched off, before ambling over to see how Yann was doing with his whining wonder. As I approached he suddenly stood up rigid and started muttering a string of oaths that - after twelve years in France - I only understood the half of. There were even some well pronounced Anglo-Saxon profanities in there - he's quite the Anglophile!

"Lost signal", he said. "Never mind", said I, "You've got the fail-safe set."

Despite much fiddling with the controls and some concerted stick waggling the image had died inside his screen specs, leaving our man writhing with ever-increasing nervous tension.

"It's gone", he finally said. "Close to the trees and by the access road."

At this point in the day both Kev and Dane - our other Brits - had succumbed to

Yann's 'all singing and dancing' quadcopter control system. Always under further development, we wonder what will come next?



the cold and scuttled off home. I wanted to too! Never mind, we needed to find Yann's expensive techno-toy before dark and the likely heavy weather rolled in. Walking up the runway in the general direction he imagined the device might be, he perked-up and said he could hear the motors still turning - all I could hear was the blood rushing round my ears and a pounding heart! Eventually I heard it too and by positioning ourselves several metres apart we were able to triangulate the unit's likely position. All fine and dandy if it was on the ground, but there was this damnable tree...

As Yann explained, in the eventuality that the fail-safe cuts in, the Quadcopter reverts to a pre-set height command then follows a GPS trail previously set in the memory. It all sounded wonderfully whizzy, as if all eventualities were dealt with - except one that is!

You see, Yann had the fail-safe height

set to 25 metres. Unfortunately the pre-programmed route took the device over a 27 metre tree! Yep, you've got it - the thing was nestled right at the top of a really nadgery *Pinus Sylvestris* (they crowd around our models and clutch at them continuously!) More profanities rent the air before our man fetched his van and dragged a length of rope from it. "You're not going to climb THAT!", I said. "Of course I will", he replied. "But only if you stay with me!" I muttered that it must be to administer Last Rites. Yann heard me and muttered that English 'black humour' wasn't really needed at the moment!

### Simian Sinuosity

With a loop of rope thrown over the lowest of the evil tree's branches, Yann used the 'stirrup' to haul himself skywards into the lower stumps of old, broken branches before ascending. We have Pine





*'Professeur' Christophe is another with the quad-bug. All the techno-clutter didn't stop the model destroying itself in a plummet over the nearby 'guerilla village'*



*Christophe's quadcopter before the soul – and model - destroying crash into the shrubbery. A superbly capable and flown device – until it ran out of signal!*



*Kevin's tortured Sky Raider pulls up into the circuit, before succumbing to a motor cut and its untimely arrival in the mire.*



*Kevin's new toy, the .60-sized Calmato; the one that attacked my digits. A brilliant low-winger for those transitional training flights – and frights.*

Martens in our local forests; they climb trees with a sinuous grace. Our man tried to emulate them but failed miserably. As he obviously became ever more frustrated with the hindrance to his ascent, his movements became less co-ordinated and soon small branches began to rain down from on high. At this point I realised I still had my camera to hand, so I began to document our flying Frog's clumsy clamber. The fact that Yann was wearing a bright orange top helped me to follow his erratic progress upwards, so I was already pondering how to use the photos to my advantage and his embarrassment...

Deftly dodging another particularly large plummeting bough, it soon became obvious to me that our hero was nearing his errant craft, as the upper branches of

the adhesive arbre were beginning to bend alarmingly. Merde alors – he's got it!

The journey to earth was tortuous and erratic, with the quadcopter having to be repositioned in the crook of a branch every metre or so to allow full use of all four limbs and beat off the clinging twigs. Eventually the mechanical marvel was passed to me, before a gasping Yann finally made it – safely – back to 'Terra very Firma'. He wore a huge smile, knowing that he'd rescued an expensive piece of kit, plus the result of many weeks' work in sorting the electronics – and not a single part or propeller was damaged when it 'met' the tree!

After a quick handshake we departed and I wondered what to do with the day's images? Obvious really – many of our guys

like a good mickey take and I e-squirted some images off to 'the usual suspects'. The comments came back thick and fast, with the best calling Yann an 'Orange Utang'. Perfect! He now has a new nickname...

### **Debutant's Dilemma**

Over here a beginner is called a debutant. No, not a toff 'gel', but a beginner. Anglomite, Dane has been my apprentice for a while and has acquitted himself well in the process of crashing, bashing and then, finally, mostly missing Mother Earth with whatever foamie model he has chosen to thrash. Most recently, after winning the battle for sustained flight without fright with his Easy Glider and my Senior Telemaster, he bought a Multiplex Mentor. I originally thought this plane may be a little beyond his nascent talents but I have been proved resoundingly wrong!

After being asked to test fly and set up this beginners' model for neutral flight at mid-revs, I realised just what a very capable aircraft it is. Very little trim change was needed from the 'as assembled' state and I found that it would fly well with just a whisper of power or at 'full chat', unleashing around 600 watts through that big prop. Chop the power and it glides better than some sailplanes I've flown!

All things considered it's a super plane for Dane to earn his proper wings with. After a couple of ropey first flights (care of the adrenaline curse), he finally relaxed and listened to the budgie on his shoulder – me, as I chirped in his ear and talked him through basic manoeuvres and how to fly in our normal circuits.

It all went well until I said, "This one's all yours mate – no verbals", which is when the adrenaline flooded back, coarsening his control movements. After a hairy take-off, care of too much throttle and twitchy transmitter sticks, Dane manfully controlled his basest urges and settled into a reasonable flight pattern. Although using large chunks of the available sky, he was managing pretty well until the LiPo cried 'time-out'. He stretched the dead-stick glide a little too far, first stalling, then 'pogging' it on that long undercarriage before the Mentor came to rest. Applause from



the paltry pit personnel brought forth a huge smile; like all full size arrivals, if the pilot walks away unharmed it was a good landing! I think we can chalk up another one as he's now well on the way to being a competent model pilot.

**Pain In The... Grass**

Kevin, our other Brit flyer, has passed into what the French call 'intermediate' flyer ability. He can safely be left to his own devices and fly alone, yet will occasionally perpetrate a whoopsie in the outfield that both brightens our day and depletes his pocket. He's quite laid back about it and admits that many of the mistakes and 'tent peg' arrivals are down to his mercurial and impatient nature. Nooo... surely not?

Just a couple of Sundays ago he was campaigning a handful of stalwart models, the ones he brings out when the weather – or he – is doubtful. Fully fettled in the pits, he chose his well flown (read 'battered') trainer, so often flown, crashed, repaired, reworked and re-covered that we don't believe it should even retain its original name of Sky Raider! Kev doesn't do engines very well – unless they are electric – he bleats for his mates to help with needle twiddling as he can't seem to get the reason why there are two of them in a carby!

With no-one to call on he fuelled and fired-up the .52 in the trainer and rolled it out to the take-off point on the runway, then 'gave it the gun' and away it went as always, droning up into the grey 'clag' that

was our 'meteo du jour'. Several circuits later he was still wagging the sticks and I turned away to prep my own plaything. Eventually noticing that silence had returned to the piste, I turned back only to find that Kevin had disappeared – and he's hard to miss, being a chap of somewhat generous proportions. Dane didn't see where he went either, so we just got on with sorting our models and flying for the next few minutes.

With us both having returned to the pits post flight, we started to get concerned as Kev's van was still in the car park and his other models were strewn about. By the time we realised that he was off in the wild heathland and we needed to back him up, Dane hollered, "There's Kev!" His model had obviously suffered a motor cut and couldn't be convinced to glide back to the runway, ending up battling the gorse thickets as it 'arrived'. As he got closer we noticed that Kev was looking somewhat dishevelled and rather damp and clarty. He asked if we knew that there was a small lake out in the heathland? We didn't. His model had missed all the grabby gorse and alighted on a clump of stiff grass, which is where he found it. Asking why he was so wet (not a comment on his personality, honest!) he told us that he'd taken a couple of strides into the grass near the model, only to find that it was floating – and that he couldn't... Sinking knee-deep into the mire, he finally grabbed his model, turned to retrace his squelching steps, only to leave a shoe behind! Not well-versed in the art



*We're even seeing quadcopters indoors now. This minuscule marvel flits around our winter home in the army gymnas, ably piloted by Jaques – when he can keep up with it!*

and science of bog dipping, it took him lots of tries to find the soggy sphagnum sunken shoe, whilst liberally coating himself with the local boue de marais.

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**RCMW**

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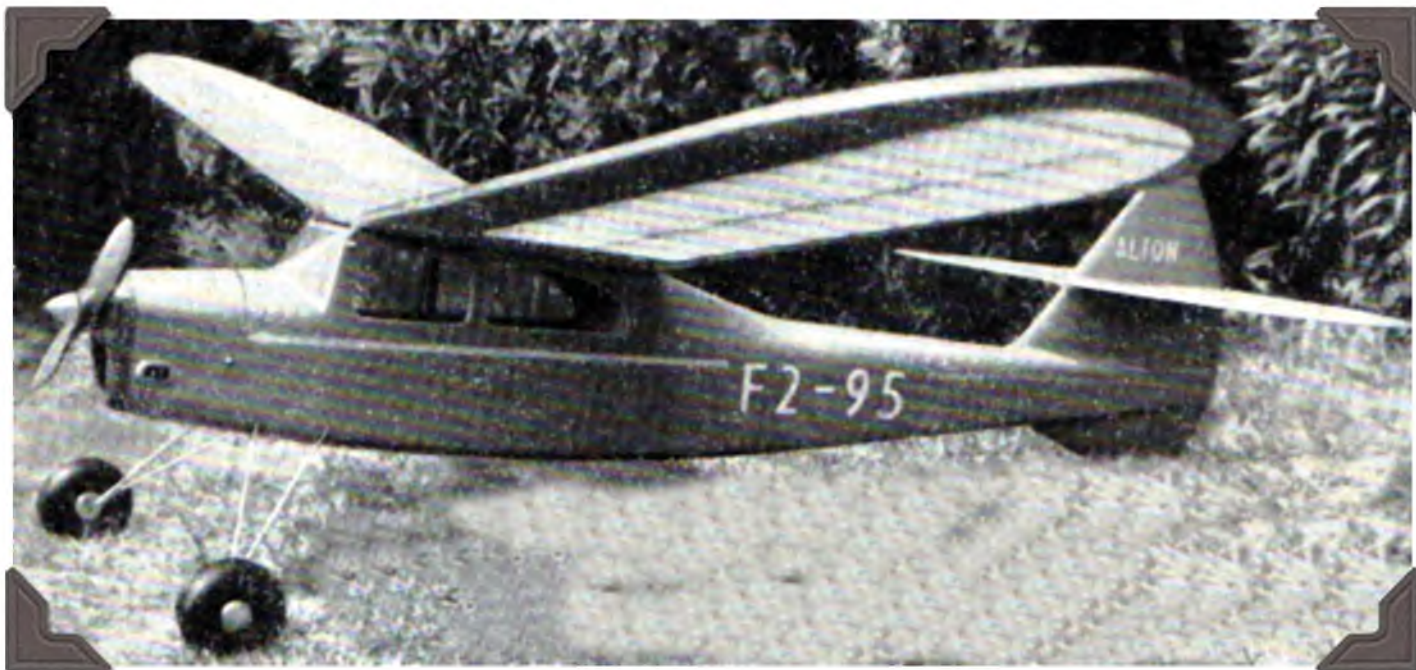
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# ON WITH THE SHOW

More modelling reminiscences by Dave Bishop of DB Sound



Six-foot wingspan Eros. It took 'Jack' Ransome only a weekend to build his version of this model

## John 'Jack' Ransom

In 1948, John Ransom (known as Jack) was a 26-year-old fellow aeromodeller at Littlehampton and we both belonged to the West Sussex Aeromodelling Club. During the war, Jack had been in the army and served quite a lot of his time abroad. Consequently some of his stories were extremely interesting to us teenagers who were filled with a keenness of anything that flew – and also anything in a skirt. He lived with his mother and she 'allowed' him to build his models indoors, because as a qualified electrician he earned far more money than most of us. Jack could afford to buy almost anything that was advertised in the monthly Aeromodeller magazine, which at that time was priced at one shilling and three pence (about seven new pence).

Another thing about Jack was that he was an extremely fast model builder. When, for instance, the six feet wingspan Eros cabin model came out (designed by John Coasby), mine took some six weeks of steady building to complete. Jack's Eros took just one weekend to fully build and was ready to fly on the following weekend. He was a good competitor at all sorts of rubber-powered competitions and we both really enjoyed competing against each other in the same event. At that time we were lucky enough to have the use of Ford aerodrome for our model flying, which was just three miles away from home. There was a bus service and sometimes the other passengers were surprised when we boarded them with our models, some of which had quite a large wingspan. At that time buses had conductors and at times they weren't too



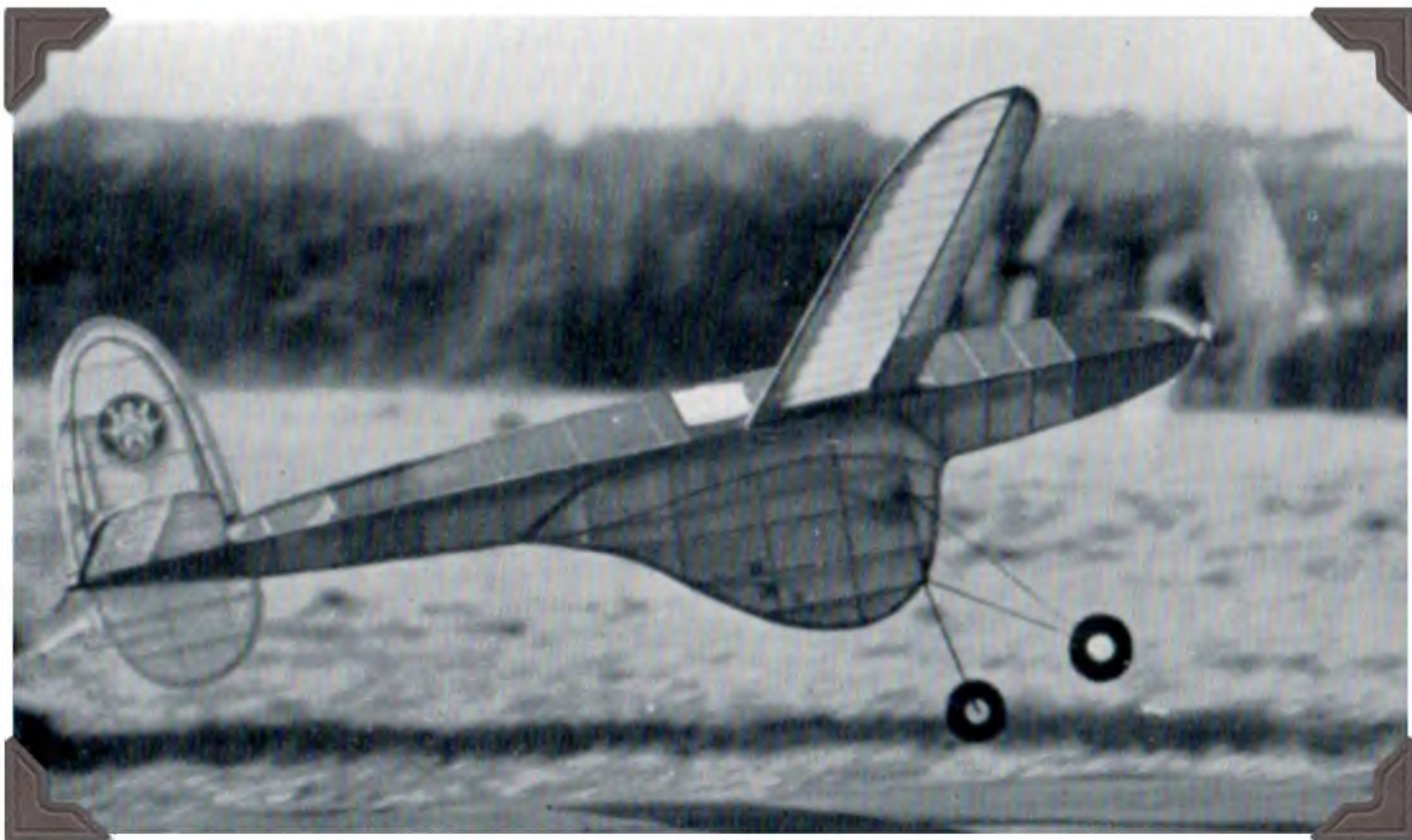
EW Evans with his Jaguar Wakefield rubber model

pleased with us balsa bashers!

One competition in particular was great fun and it taught me a huge lesson of never ever changing the trim of a model on a competition day. It happened when I had built the first of three E W Evans designed Jaguar Wakefield models. This particular model had won the Wakefield Cup in America when flown by Roy Chesterton of Northampton. I loved it at first sight.

On the Friday evening after work I bought all the parts listed in the Aeromodeller plans at the local David O'Jones model shop in Littlehampton. I started building it immediately I got home. Long candle burning hours ensued and I finished clear doping it at 4 am the following morning. After a few hours sleep, I installed the 16 strands of skeined lubricated quarter inch flat Pirelli rubber and at 10 am off I went to





The original Jaguar performing an ROG (Rise Off Ground) launch

the local flying field. My eight ounce Jaguar Wakefield model was ready to prove itself to be the thoroughbred that it was, in preparation for a competition planned for the following day at Ford aerodrome.

### Wakefield Competition

The following morning dawned with horrible drizzly weather and overcast skies, coupled with strong winds. In fact everything was against such an event being staged and we wondered if it would be put back a week or so, when conditions might hopefully improve for the eight entrants. "Not so", said the chairman Bill Gates (no relation to the computer geek) and so we prepared to fly.

Jack Ransom had a nice looking home built 44" wingspan model that measured up for the 'rules'. He wound on 300 turns, the model flew very well and he had a good time of almost two minutes. I was next with my Jaguar and I also wound on 300 turns and ROG'd (rise off ground take-off) and away 'she' climbed like a dream machine in a smooth left-hand turn. My time was nearly three minutes and round one ended with me in first position and Jack in second. The rest of the entrants trailed behind us with some model fatalities due to the destructive wind conditions.

### Rounds Two And Three

The wind was getting stronger and those entrants of us who were left wound up the rubber motors on our models. Jack completed a super flight with well over three minutes, which counted as a max (180 seconds). I wound on 500 turns and away went my Jaguar, and I felt very proud when I had a 180 second max as well. I was then shocked to find that Jack's model

had landed badly and its wing was cracked in half. The result was that at the end of the second round I was leading Jack by 27 seconds and so was in first position. I really thought that the winning trophy was going to be mine. Surely just 400 turns would do it on the third and final round? To my surprise, Jack had glued his wing back together and his model was soon wound up for the third and final round.

I held back to allow Jack to launch his model first. It rose off the runway and screwed itself into the nearby grass for a score of 11 seconds. All I needed to do was to fly my Jaguar for 17 seconds and the trophy would be mine. This is where I made my biggest mistake, and one I would never forget for the rest of my modelling career. I'll never know why but I thought that I would really show everyone just what a Wakefield Cup winner was all about and so I stupidly packed a one sixteenth piece of balsa sheet under the rear of the tailplane. I worked it out that in the last flight of the day my aeroplane, with my modification, would elevate its nose upwards and get much more height and easily do another max. I would show them!

Away went the Evans Jaguar and immediately it went into an almost vertical left-handed climb. Within a few seconds its nose dropped and it was flying level into the strong wind and then it put its nose down and dropped out of the sky. The watches were clicked at 13 seconds and I had just lost the much needed winning total. A thrilled (and well deserved) Jack was presented with the trophy by the Chairman. It was a lesson learned and never forgotten, and I haven't changed the trim on a competition model ever since that day, 67 years ago!

### The Coat Hanger

Jack Ransom was an innovator and one never knew what model he was going to produce next. One day I was at his house when he had invited me to visit his new model building shed in his garden. It was properly lined and insulated with an 8 foot long building bench along one wall. The floor was carpeted and he had a small wood burning fire in the far corner, which made me really jealous. Mind you, the guy had been abroad fighting the enemies of Britain in the Army for our freedom, so all that he had was well deserved.

Clamped in a small vice was a Mills 1.3 cc diesel engine and he was filing away at its exhausts to make them larger. His theory was that his Mills diesel would be faster than all of the rest. Jack had also carved a square tipped Payne propeller, which he said would match the extra power generated by his modification. I questioned Jack as to what was the model that this super dooper racing Mills motor was going to wear? He went to a small cupboard and withdrew a wooden coat hanger. It was shaped like a flattened 'U' and he had glued a pylon platform a third distance from the front and a plate at the end for the tailplane and rudder. The wings were from an old control line model and were attached by rubber bands. On the upturned part of the nose he had glued a plywood plate to mount the engine as a sidewinder. The coat hanger hook was screwed into the underside of the 'U' and the outside edges of the tailplane had two large under fins, which then made the model have the necessary three points for an ROG (Rise Off Ground) flight. I looked long and hard at his flying 'Coat Hanger' whilst he said, "It's an ugly b\*\*\*\*\*, aint it?"





In more modern times, Dave Wright with his Jaguar Wakefield model



The Jaguar performing an ROG take-off

I hesitated and replied that, "You shouldn't speak like that to any aeroplane because they have feelings you know!"

I wondered if it would ever leave the ground and, if it did, what sort of flight would result? It certainly looked different and Jack was right because Coat Hanger certainly wasn't a looker. So with a can of diesel fuel and a chicken finger flicker, off we went in Jack's car at 7 pm to Ford Aerodrome for its maiden test flight.

### Coat Hanger Flies

The evening was flat calm as we drove to the main runway. With me holding Coat Hanger, Jeff it was who fuelled up the much modified Mills 1.3 cc and then flicked it into life. With a little twiddle on the throttle, the engine literally screamed with more revs than either of us had ever heard from a 1.3 cc motor. After a quick look at me, Jack launched the Coat Hanger up at an angle of 45 degrees.

Up sped his latest creation at a heck of a rate and screamed into the largest inside loop we had ever seen. Then the aeroplane dived towards us like a Stuka dive-bomber! We stood rock steady as it grew larger until we suddenly realised that this model wasn't a model aeroplane at all but had turned into an attacking missile. It seemed to be intent upon the destruction of us all as it levelled out and missed us by a few inches. As it howled by, Jack let out an Army oath and off it went upwards again, flat out into the evening sky. Another high inside loop followed and down it came again, seemingly determined to exterminate us. More oaths followed and by this time Jack, with much fear in his eyes, ran like mad to his car to hide. This time Coat Hanger's looping and diving took it on a different course – off it veered towards Jack's car. From underneath the vehicle I heard Jack shout out that the b\*\*\*\*y thing was determined to kill him. I, also in great fear, shouted that I agreed with him!

Up went the model into another high loop and down she roared vertically towards terra firma, as I flattened myself on the runway with a much pumping heart. It screamed a few feet over my head and then there was a 'whump'. All was suddenly quiet and I looked around for Coat Hanger, but it was nowhere to be seen.

I quietly asked, "Where are you, Jack?"

After what seemed an age, from under the car I heard, "I'm here!"

"Where's the plane then?" I asked.

From underneath the car came a weak "It's here – with me..."

That model had a personal hatred for Jack and I never saw it fly again. Neither did we ever mention its name – until today that is!

**RCMW**

**"YOU SHOULDN'T SPEAK LIKE THAT TO ANY AEROPLANE BECAUSE THEY HAVE FEELINGS YOU KNOW!"**



# ROBERT MAHONEY MEMORIAL ELECTRIC FLY-IN



*Dave Chinery reports from the annual Southern Area Electric Fly-In, held in memory of its late organiser, Robert Mahoney*

*The huge 16 ft span Boeing B-50 by Tony Nijhuis, with 'Little Friends' escort! The large Hangar 9 P-47s give it scale*

## Electric Power Generation!

Every summer for over 20 years, the huge grass airfield at Middle Wallop has echoed to the silence of dozens of cutting-edge electric models filling the air. Starting in the mid-1980s, the British Electric Flight Association organised an annual two-day event at the field, attracting flyers from all over the UK and abroad. Aably organised by Robert Mahoney, they were deservedly popular and allowed average modellers to look and learn from the experts.

By 2005 electric flight had become arguably mainstream. The British Electric Flight Association concluded that its promotional job was done and the members elected to disband. Since then, Robert Mahoney has run the fly-in as a stand alone event, still attracting people from all over, including the Jepe team from Holland.

Early in 2015 a combination of long-term health problems led to the loss of Robert, who is missed by his family and friends. This includes many people inside and outside of the BMFA, for whom he wore several 'hats'. Not wishing to see the Middle Wallop Fly-In lapse, I took over the organisation of the event. Sponsorship was obtained from the BMFA London Area and, after a 'paper war' with the Defence Infrastructure Organisation, we secured the license.

The Robert Mahoney Memorial Electric Fly-In was held on the 8th and 9th of August 2015, and benefitted from the lovely weather that weekend.



*John Ranson preparing his big Mk.4 DH Venom*

## Saturday

The light airs of the Saturday tempted a good number of modellers to attend and a wide variety of types and sizes were soon taking to the air. Star performer of the day was Ivan Goodchild, with his large B-17 and A-10 Warthog, each making several very realistic flights.

Another significant EDF model was the large DH Venom Mk.4 by John Ranson. Intended for turbine power, this model has been completed by John to his usual high standard and flies on two 12S LiPo packs! The 12-blade fan unit produces ample thrust and there is no EDF whine, just a very realistic whoosh from the exhaust. The model flies superbly in a very realistic manner and John was confident enough to fly some very low passes for the cameras.

Other notable models included a 4 metre-span SF-28A Scheibe Falke motor-glider. Built by Martin Tremlett to the Cliff Charlesworth plan, the model was formerly



*Robert Mahoney's SF24A motor glider, now flown by Gordon Tarling has 4 metre span, 8 kg weight and flies on an 8S battery, driving a brushed Plettenburg motor. Inset flight photo by Bob Corfield*





*Bob Partington's P-47A Razorback, converted from a Hangar 9 Bubble canopy version*



*Jan Bassett's fast and furious E-flite 'Deuces Wild' twin has retracts*



*John Gregory's tailless gliders*



*Roy Thompson's neat Martin-Baker MB-2*



*Roy Thompson's ejector-seat Meteor*



*Unusual four engined Dornier flying boat*

owned by Robert Mahoney. It is now owned and was flown by Gordon Tarling in his memory.

A number of other large, electric powered gliders were also flown, benefitting from the 'lifty' air that day. Among several significant warbirds, Bob Partington's P-47 Thunderbolt stood out. Originally a Hangar 9 bubble-canopy ARTF, Bob has converted the model to an early Razorback version and added a sound system, which contributed greatly to the realism of its flying spectacle.

**Sunday**

The day started warm and clear and with a little more breeze than the previous day. With the change of date from previous years there was no longer a clash with

the Woodspring Wings event, so we were expecting more attendance from the West Country. Among the arrivals were Tony Nijhuis and Chris Golds, who would have previously gone to Woodspring, and many more flyers from all over the UK – one from as far as Tyneside!

Before getting on to my favourite subject – scale models – a wide variety of sport models were flown. One very energetic example was the twin motor 'Deuces Wild' flown by Jan Bassett, contrasting with gentler models like the bird-like tailless models of John Gregory. A whole range, from electric racers to soarers, was complemented by a few 3-D helicopters and quad-rotors, whose agility and speed still amazed spectators.

Moving on to scale models, the range

of sizes and types offered something for everyone. Probably the most obscure was the little Martin-Baker MB-2 from Roy Thompson, who also flew his model of the MB-operated Meteor jet used for ejector seat trials. Roy hopes to modify the model to feature a real working 'bang seat' in the future. Roy is a real Martin-Baker fan, as he previously built and flew a model of the contra-propped MB-5. Fitted with NiCads and brushed motors, this was tricky to fly and is no longer with us!

Another obscure type was a model of a four-engined Dornier flying boat, a development of the record-breaking tandem-twin Dornier 'Wal' (Whale) aircraft of the 1920s. Staying with watercraft, George Worley (of 4-Max fame) flew his familiar Short Sunderland many times.





George Worley's colourful Flair Harvard



Nice Antonov AN-2 is an unusual subject



This lovely Avro Anson won a Trophy last year. The Anson's internal detail included scaled-down maps, log books and radio



The F-84s and Miles M52s by Will and Dave Beavor (taken on a previous occasion)



This Bucker Jungmann flew very well

George also flew a very pretty Harvard from the Flair kit.

Before moving on to the 'show-stoppers', many 'handy-size' models deserve a mention. A superb Avro Anson featured painstaking internal detail, including scaled-down maps on the chart table and similar aircraft handbooks. The face of the radio set in the model was reproduced from a photo of the real thing in a preserved aircraft.

Father-and-son team, Dave and Will Beavor brought along their collection of small EDF models, including a Venom in the G-GONE livery and a superbly finished F-84 Thunderjet. (Father Dave is a retired professional aviation artist – and it shows!) Most interesting (to me anyway) is the little Miles M-52 model celebrating the design

which, except for politics, would have been the first aircraft through the sound barrier, piloted by our own Lt. Commander Eric 'Winkle' Brown! The scale annular air intake is an unusual feature that looks too small to work, but it does, and the model flies very well. Following the success of the little model the Beavor's are building a much bigger one with flaps and retracts – watch this space!

Biplanes were well represented by an Antonov AN-2, a Bucker Jungmann and a very nice dH Dragon Rapide, reproducing an aircraft I have actually flown in!

Larger models included Bob Partington's acoustic P-47, now joined by two other more 'stock' Hangar 9 examples, keeping a sharp eye out for any Huns around, in the shape of Chris Golds' pale blue Junkers

Ju-188. John Ranson again flew his big Venom, but the undoubted star of the show was Tony Nijhuis' huge Boeing B-50. At about 5 metres (16 ft) span and nearly 50 kg (100 lb) weight this is without doubt the biggest and heaviest electric model this side of the Atlantic and is impressive in the way it flies and sounds.

The B-50 was the last development of the B-29 used against Japan and featured uprated engines and an extended tailfin. The model is not new and has also been uprated, packs of LiPos replacing the gazillion NiCads it was originally powered by! As a bomber the model features the obligatory 'bomb-drop' function, but this time, it was a whole 'stick' of bombs that it dropped.



## MAHONEY MEET



The lovely DH89A Dragon Rapide models an aircraft that the author has flown in



Chris Golds' slim-line Junkers Ju-188

### Taxying In!

Over the years the Middle Wallop event has seen a good level of sponsorship from the model trade and trophies have been donated for award to deserving models and flyers. New this year was a lovely Robert Mahoney Memorial Trophy, to be awarded for best model/flight at the show. Robert's widow, Diane, kindly consented to award the Trophy and Tony Nijhuis was the recipient for his amazing B-50.

The Exide-Drydex Cup was awarded to John Ranson for his DH Venom and the RCM&E 'Propellor' Trophy went to Bob Partington for his ultra-realistic P-47.

This year's event attracted a good number of flyers by today's Electric Fly-In standards, in spite of the relatively late organisation, change of date and minimal advertising. Next year we hope to improve on all of these and will be working to attract relevant traders to support the event, and so hope to make it a bigger occasion than ever.

Pencil in the 6th and 7th August, 2016 and make a weekend of it. Camping and caravanning is available at the Museum of Army Flying so there is no excuse!

Finally, I would like to thank the BMFA London Area for their support, together with all those who helped, including Lucy at the Museum, who helped solve a serious last-minute hitch. See you next year! **RCMW**



John Ranson's superb Mk.4 Venom touching down (Bob Corfield photo)

### CONTACTS

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#### BMFA London Area:

bmfa.org/The-BMFA/Areas/London-2



Ivan Goodchild's B-17 'Sally B' on finals (Bob Corfield photo)





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# THE MISTAKES WE MAKE

*From South Africa, Chris Freeman shows how simple errors can make an R/C model aircraft unflyable, and how to fix those mistakes*

*This PT-17 Stearman was purchased as new from an estate sale (Peter Connan picture)*

**A**fter a recent house fire (started by LiPos), I purchased a number of second-hand R/C model aeroplanes. This proved to be the most cost-effective way of replacing what was lost in the fire. Most of the aircraft had been sold because the owners were too scared to fly them, or unhappy with the way they flew. Whilst I was preparing these models for flight I found that most had very little chance of meeting their former owner's expectations due to simple mistakes that could have easily been corrected. I made a list of four such models that exhibited these issues so that we can all learn from my experiences.

## **Model 1 - Phoenix Models Cessna 182**

I bought this model complete with all servos and an OS 200 FS engine (with only three flights!) for less than the cost of the motor alone. I checked the various R/C forums and found a few positive reports about the aircraft, but also a number of complaints about the weak nose gear mounting. Upon removing the cowl I discovered a crude repair to the firewall and I also discovered that the motor was too large for the airframe! I made repairs to the firewall to strengthen the nose gear mount and changed the motor to a 25-year-old OS 120 FS. The C of G was perfect with this motor and test flights confirmed that the motor had plenty of power, with most flying done at just over

half throttle. I'm sure the airframe had previously been unpleasant to fly as the OS 200 would have had far too much power and it also made the model nose heavy. No wonder it had been sold.

## **Model 2 - Hangar 9 B-25**

This was another complete model with all servos and two OS 55 two-stroke glow motors, which I purchased for less than the cost of the kit alone. The B-25 had been flown but scrapes on the tail and wingtips seemed to indicate a few problems. I checked the blogs and found a lot of information ranging from rave reviews to very unhappy customers. I was sure that a shortage of power was not an issue. I did not know the brand of servos but, once again, the Internet came to my rescue. I discovered that the elevator servo was a fast servo best suited to helicopters and only rated at 2.5 kg, which was not enough for this function. By contrast, the nose wheel steering servo was an 11 kg servo that was total overkill. The manual recommended a 5-cell 2000 mAh NiCad to power the receiver. I could not access the battery but cycling it indicated that it was over 1500 mAh, so the pack seemed to be in good condition.

I installed a receiver and did the required set up to ensure the correct direction and movement on the control surfaces. I checked the tanks and motors and all was good, so it was soon time to test the



*How not to secure weight to a PT-17 to correct the Centre of Gravity! This fishing sinker was secured with a cable tie and some Blu-Tac*

motors. The first motor started easily, but the second was a little harder to start as the carb was closed a little more than the other. No adjustment was available at the carb as the throttle linkage was simply a piece of wire with a 'Z' bend. To adjust this I had to take off the motor nacelle on the wing and adjust at the servo. I corrected this and soon had the motors running but both died when I checked the aileron and flap function.

A closer check revealed that the radio was going into fail-safe whenever the controls were moved. I managed to remove the aircraft's plastic nose to access the battery.



I found that two 1500 mAh packs had been connected by a 'Y' lead that then connected into another 'Y' lead that went to the switch and battery checker. When all the controls were moved, the NiCad battery could not provide the required receiver voltage. When I removed the 'Y' leads and replaced the packs with the recommended size NiCads (I can still get NiCads so I used them) the radio problems went away. Despite the new NiCads being heavier than the original packs, I still had to add nearly 100 grams of lead to get the C of G correct. Since then I have really enjoyed flying this aircraft. It was a challenge to fix, but it is very rewarding when you get it right.

### Model 3 – Great Planes Military PT-17 Stearman Biplane

This model was purchased as new from an estate sale. It had never flown and cost less than the price of a new kit. It came with an OS 90 pumped four-stroke (that had never been run) and all the servos. The model appeared to be well put together, but the fishing sinker I found tied to a dummy cylinder had me a little worried. I checked everything out and could not find any further issues other than it still required 300 grams of lead to get the C of G in the correct position. I was concerned about the size of the motor as the online blogs that I checked had airframes fitted with ST 2500 and some with 180 four-strokes. Luckily, the test flight showed good flight performance and sufficient power for scale-like manoeuvres.

### Model 4 – Black Horse Stuka

I wanted a warbird for the annual event that I have been attending for the last 13 years, so I purchased a new aircraft that had never been flown and which had been converted to electric. The airframe was well built and equipped with Hitec digital servos, a Turnigy G110 motor and an ESC to power it. The only thing I changed was to make a more secure battery box. I had to buy new LiPo packs for the aircraft as it originally had two 4-cell packs. As I had no Watt meter to do all the tests I would normally do, I did not perform any power checks at home and decided I would test fly it and see how it went.



*The Stearman, ready for another flight. I was nervous that the motor would run too hot in the cowl but it is fine*



*The Spitfire is caught by Peter Connan's camera during a classic banked turn*



*My Stuka, along with its arch rival the Spitfire. Both are great aircraft to fly and give one a sense of accomplishment when done right*



## MISTAKES WE MAKE

Early one Saturday morning I went to the field to test fly it and assembled the aircraft at the pits. This required a stand as the model had to be inverted to gain access to the battery bay. Once assembled I did all the control checks to ensure everything was moving in the right direction. Checks completed, I happily taxied to the end of the far runway so that I could take-off with the sun at my back. Before I took off I decided to check the motor power and held the rudder with one hand while slowly opening the throttle. At 3/4 throttle I heard a screeching noise and then the motor stopped. This is normally an indication of a timing issue. I tried again but the motor just shuddered so I closed the throttle. On my third attempt the motor started but suddenly there was a bang followed by lots of smoke and then flames. I stood in shock as I was alone at the field and could not access the batteries, which I suddenly realised had about three times the voltage and capacity of the LiPos that had burnt my house down. I think my brain went into fail-safe and I found myself on my knees trying to blow the fire out!



*The Phoenix Cessna cowl showing the large holes leftover after fitting an over-sized OS 200*



*B-25 still in upgrade mode. I only fit cowls and fairings after I am happy with the reliability of the whole package*

Luckily the flames soon stopped and I returned to the pits to unplug the batteries and investigate. Fortunately, the damage was limited to a blown ESC. I did find that the smoke and flames had added some quite realistic weathering to the cowl and exhausts, but it is not a method I will try again. Google once again provided information that the ESC was prone to do this given similar circumstances. The fact that I had not tested the motor set up in a controlled manner, nor did I make provision for things to go wrong, all worked against me. Do not assume that things will work just because they're supposed to. Air crash investigations confirm that poor maintenance and pilot error are the largest cause of accidents.



*I was not sure about this engine mount but it does work and no additional nose weight was needed!*



### The Internet And Its Pitfalls

I use various model sites to get information on a kit before I buy or complete it. While I often find invaluable information on these sites, I also find heaps of unreliable info. It's a good idea to get advice from a club member who does the most flying and not from the one who does the most talking about flying. Many years ago RCMW ran a series describing these kinds of characters and I often think of them while reading the blogs.

Before deciding to buy a new model, first decide what sort of flying you want to do and then be honest about your building and flying skills. Many of the blogs that have negative comments about certain kits appear to be from people who do not have the required skill to build or fly these models. If you want to do aerobatics, get an Edge or Extra type aircraft. A Cessna fitted with a large engine is not a good idea. Similarly, a warbird with a fibreglass fuselage and a painted finish will be heavier and harder to fly than a Hangar 9 warbird that is all wood and covered with iron-on film.

In general, a scale model will take more time to build and set up correctly and will be less tolerant of mistakes. Scale aircraft do not use the extreme control throws required for aerobatics and 3-D flying so you will not need powerful servos and large servo arms. Smaller servo arms make it easier to set up the control surface movement and are also less susceptible to servo centring issues.

### An Honest Appraisal

Get to know your environment and flying field. Are they suitable for the type of aircraft you want to fly? I have a Sky Surfer electric pusher that is very noisy and not the type of aircraft that can be flown in noise-sensitive areas. My flying club has grass runways and they are not up to bowling green standard so larger wheels are needed. Our club is also 5500 feet above sea level and the temperatures in Johannesburg can be quite hot. Performance can be very different from that at sea level as engines produce less power and wings have less lift in thinner air. The better and usually more expensive kits have well thought-out and informative instruction manuals with updates posted on the manufacturer's website. You should make use of the information provided as it has been tested and will work, if you do make changes, please ensure that you have the required experience to do so.

I got an ESM/YT Dauntless from the classified section of our local aviation website and was very disappointed by the way it had been butchered. There was no way the aircraft could have been flown in its condition. The previous owner had cut the mounting lugs off the servos and glued them into the wing. Likewise, the pushrods had been changed from what was supplied in the kit.

### Prevention

When building or assembling a kit take a little extra time to fuel proof the forward portion of the fuselage. I often use epoxy

or polyester resin as this adds strength and protects against fuel leaks (which will happen at some stage). I also use resin in the retract wells in my warbirds and have not had the retracts break out as I have read about in the blogs and magazines.

Make sure that your C of G is correct. If building a heavy aircraft do not think that you can save weight by not adding lead to achieve the correct centre of gravity. In general the heavier the aircraft the more cautious you should be when it comes to balance. WWI and WWII warbirds had large and heavy engines so their nose moments are short; consequently scale models usually require the addition of lead to achieve the correct C of G.

Build blogs often feature modellers accusing scale kit manufacturers of a poor design if lead is required to achieve the correct balance. This is not the kit manufacturer's fault, but rather a result of the full size aircraft design. I am always disappointed when I have to add weight

to my aircraft, but in the eight Spitfires and two Hurricanes that I have built I have always had to add large amounts of lead, despite building the rear of the airframes as light as possible. If you look at the side view of these aircraft you will see that the firewall is not as far forward as it would seem. Then you must consider the weight of a Rolls-Royce Merlin engine used in the real aircraft. If nose weight is required please make sure it is securely mounted as lead does have a way of working loose. I even know of a full size KR2 that crashed when the lead mounted in the spinner flew off.

Correcting these kinds of common mistakes has resulted in rewarding model aircraft that often exceed my expectations. Our hobby is about having fun or achieving a goal, but it can quickly become demoralising when a model is unreliable or unpleasant to fly – or even worse, when they crash.

**RCMW**



*I like to try to keep my installations as neat as possible. The 35 MHz receiver and NiCad are packed with foam to reduce the effect of vibration. A 2.4 GHz receiver should not be wrapped in foam due to the heat it creates but it is also less sensitive to vibration*



*WW2 warbirds had large and heavy engines so their nose moments are short. Consequently scale models usually require the addition of lead to achieve the correct C of G (Peter Connan picture)*



# A FIRST TIME VIEW OF THE BMFA NATIONALS



*Bristol M1c by Jim Reeves, the monoplane that was too far ahead of its time for the military*



*Vaughn Entwistle attends his first BMFA Nationals and discovers what makes the 'Nats' so special*

**L**ike the coming together of the clans, once every year the aeromodelling communities, in all their different tribes, congregate at the British Nationals. While the Nationals, or Nats as most know it, is a series of competitions for the best in their discipline, it is also a chance to reacquaint with old friends, score some swag at the vendor tents (and swapmeet), and to share a few days in the company of like-minded folks who live and breath this fabulous hobby.

This was my first Nats. If you have never been, let me tell you that it was every bit as special as I had imagined. First there is the venue: RAF Barkston Heath in Lincolnshire. This vast airfield was once home to the USAAF (United States Army Air Force) during WWII. Nowadays it is home to the Joint Elementary Flying Training School, which operates Grob Tutors. The airfield is not just big, it is immense, which makes it perfect to host the nine-ring circus of simultaneous flying events that is the

Nationals. If you're a flat-earther, stand at one end of the main runway and you will see physical proof of the curvature of the earth. Yes, it's that flippin' long!

When the gates open on Friday, hundreds of motorhomes, caravans, and cars packed with tents and models come spilling in, as RAF Barkston transforms into a temporary village, populated exclusively with mad keen modellers.

## Scale

For some modellers it's not enough to invest the time and painstaking hours in building a scale model, they also need to risk all that labour by competing with the model. Scale has to be one of the most rigorous competitions in the Nats. The first step is static judging. The models are placed on a table in a special judging tent. Entrants must also provide an accompanying scale documentation package. The judges then award points based on accuracy to scale and craftsmanship.

So much for the static judging. Next comes the flying section. Here each model must complete a set of manoeuvres with the pilot being graded on realism of the flight and the execution of said manoeuvres. On the Saturday this proved quite challenging, as there was a stiff breeze blowing along the runway for the entire day. Sunday's weather flip-flopped with calm conditions with dull, overcast skies and rain sprinkles into the afternoon.

Still, those of us spectating got to see stunning biplanes, warbirds, tri-motored airliners and all manner of skilfully crafted models of all eras performing their routines. In a word: magnificent!

*Right: A view of the Airco's stunning cockpit detail*



*Mick Henderson's Airco DH 9a*





*Mick Reeves' Sopwith Strutter in the scale-judging tent*



*Modern aircraft are also popular subjects. Here is a lovely Cirrus SR22 flown by D Fisher in Flying Only*



*The Master's touch: Richard Crapp's Westland Wessex gets a pre-flight fettle*



*An unusual subject, the lovely Japanese Tachikawa Ki 19 biplane of J Hartnoll glows in the Saturday sunshine*



*Biggles to the rescue! Steve Jackson's Avro 504 K rolls in for a strafing run*



*Close-up of the Avro 504 K shows the scale detail*



*Love those biplanes! Another lesser-known scale subject, the Blackburn Sprat, modelled by Terry Manley*



*Dave Knott's Hurricane is an award-winning veteran of many Nats*



*Pretty in any colour. Andy Bowman's yellow Tiger Moth lifts off*



**F3A Aerobatics**

The flight line at this event was resplendent with sleek and slender beauties with drool-worthy paint schemes. Rules specify that all models must fit within a two metre square box and weigh under five kg, whether urged by electrons or powered by glow fuel. F3A models are designed to fly an exacting pattern of aerobatics and many bristled with all kinds of aerodynamic trickery such as a flying surface called the canalisers. Usually mounted amidships atop the fuselage, the canalisers are a miniature wing that keeps the boundary layer attached along the rear fuselage to enhance rudder effectiveness. Many models featured servo-operated split rudders or split canalisers, or even contra-rotating props – all designed to increase drag and slow the model on the downward half of a manoeuvre.

The combination of techno wizardry and advanced pilot skills made for an amazing display of world-class aerobatics and many of the flyers present compete on an international level for the GBR team.



*Kevin Caton's Citrin F3A model shows off its swoopy and futuristic lines*



*Contra-rotating props whirring, an Allure climbs out to begin its aerobatic routine*



*Not all F3A models come in a box. Graeme Jones (age 61) has been flying for fifty years and campaigned his own design, the Deluge+*



*Close-up of contra-rotating props used by many competitors. The props free-wheel in one direction only, to provide braking and control the model's speed on the downside of the loop*



*Canalisers (small upper wings) are common on F3A models, but the one fitted to Gerhard Fehringer's Oxai Galactik is huge!*

**IMAC**

The International Miniature Aerobatic Club (IMAC) is a club for scale aerobatic competition. IMAC models are scale models of actual aerobatic aeroplanes and must be capable of replicating the full size

aeroplane's aerobatic repertoire. In IMAC basic, you can fly anything you want: scale, semi scale or non-scale. The advanced classes generally involve large models with wingspans up to three metres with

petrol engines. And because 'bigger flies better,' this means that most of the field at the Nats was made up of large models powered by large motors that carved up large areas of the sky.



*IMAC aerobat getting fired up for an aerobatic routine. These are big scale or semi-scale aerobats that look and fly like the real thing*



*Another IMAC plane cruises in for a landing. Notice that extreme neck strain has taken a terrible toll on the poor pilot*





IMAC is super popular in the North of England and many flyers had made the trip down to Lincolnshire



This gorgeous Sukhoi with its flame paint job was a crowd favourite



Even the pilot looks rugged and handsome!

**Helicopters**

Despite the explosive growth of four-bladed flying contraptions in recent times, helicopters remain popular and have reached an amazing level of capability and refinement. Two classes were flown at the Nats:

F3C involves precision aerobatics and is the flying schedule flown by all countries that compete in the European and World Championships. F3C helicopters are fitted with full bodysells which often feature stunning paint schemes. They fly a routine of smooth, flowing manoeuvres that typically end with an autorotation down to a landing spot.

F3N helicopters are often heard before they are seen, and the roar of tortured rotor blades is unforgettable. These models are the 'Mad Max' kind of helicopters that fling about the sky in a series of hyper-fast, violent 3-D manoeuvres, rather like a mad moth batting about a street lamp. Non-contestants often watch these mind-boggling manoeuvres and wonder aloud: "How on earth...?"

You get the idea.



Fierce concentration evident as Roger Mayo hovers over each flag in turn



Gorgeous paint jobs aren't just for fixed wing models. Another heli-looker



F3C National Champion, Steve Roberts displays his super sleek aerobatic helicopter – a JR Sylphide in full body kit



## BMFA NATIONALS

### The Show Must Go On

As at all Nats, there was a daily showline where some of some of the country's top pilots and their models flew their signature routines. This made for a sky perpetually filled with roaring jets, thunderous giant scale warbirds, and heart-in-the-mouth aerobats who kept spectators perched on the edge of their folding camp chairs. This year, Dave Tappin of Dawn Patrol fame was joined in the commentary box by Ivan Goodchild on the microphone providing the blow-by-blow commentary to keep the crowds informed and entertained.



*These two giant Extras really ripped up the skies with their show-stopping aerobatics routine*



*At the show line pits. Plenty of variety: big jets, big scale, and huge aerobats made for an on going spectacle*



*How low can you go? Ultra-violent manoeuvres barely skimming the runway got everyone's attention*



*An iconic shape in the sky, this jet-powered Lightning looked and performed just like the genuine article*



*What would a summer model air show be without the famous father-son team, Steve and Matt Bishop and their BAE Hawks in Red Arrows livery*



*A modelling rarity, one of the Cold War's most feared Russian jets, the mighty MiG-21*



### Pylon Racing

Some impressions: large, burly men in hard hats waving flags or holding aloft tiny model aeroplanes. Tuned-pipe motors with the ear-syringing shriek of a dental drill boring through sheet steel. Small planes with carbon fibre scalpels for wings locked in a vertical bank while streaking around a course at retina-scorching speeds. Yeah, that's pylon racing. Terrifying even to watch, I cannot imagine trying to fly one of these micro-missiles. However, doing my duty as a Traplet editor I donned a hard hat and took up position in the middle of the pylon course, camera and long lens ready to catch the action. What? Are you havin' a larf?

I shot dozens of photos and but mostly caught a skylful of nothing. On several frames I got lucky and caught a disappearing wingtip, the tail end of a fuselage. On two frames I managed to catch a full profile, but they were both too blurred to use. The camera was useless, but mostly I caught a few impressions. That's pylon racing: mind-meltingly fast. This is a pastime for hairy-chested manly men who chew tobacco and chug Redbull by the pint. My knees were still quaking as I handed back the hard hat and stumbled away from the flight line seeking out a quiet place where I could have a bit of a lie down.



*Big burly men with small, insanely fast models... Welcome to pylon racing. For safety, they use a staggered start*



*Top F3D pylon racer Ben Jones prepares his slippery racer for another trip past the chequered flag*



*Mark Chinery (L) and Darron Rodriguez (R) proudly display their Avionik DO5 F5D pylon racers. Motor by Leomotion, running a 12" X 21.5" own design propeller*

### Fun Fly

I'm embarrassed to admit that I'd never seen this event before. (As a matter of fact, I do live in a cave. Why do you ask?) But after watching some of the aerial shenanigans over two days, I definitely want to try it.

Split over two classes (Class 2 is for entry-level and Class 1 is for steely-eyed pros) Fun Fly involves some wacky tasks that tax man and machine to the limit and include such things as Climb and Glide, Triple Thrash, Touch and Go, Spins and Spots, and Limbo. Many of these events are self-explanatory. Some are little more obtuse. Two of my favourites were the Water Carrying event and Limbo.

In the water carrying event, models must lift a Styrofoam cup filled with a measured amount of water, fly a circuit and then land. The contestant who loses the least amount of liquid wins. True aerial aces can up the ante by throwing in a loop to double their score. I saw it being done, and amazingly the pilots were able to launch, fly a circuit, pull a loop and land, all while scarcely spilling a drop! Now that's skilful piloting.

A favourite event for pilots is the limbo. Here a competitor must take-off, fly a circuit and then complete as many passes beneath a limbo tape within a two-minute window. The fastest and cleanest way to do this is to loop. Sound easy? Yeah, you try it! The best strategy involved pulling multiple loops, with the bottom of the loop happening as the model passed beneath the ribbon.

I saw a high score of 38 loops. Fun Fly looks like an absolute hoot. Okay, that's yet another model I need to acquire.



*LIMBOOOOOO! Fun Fly contestant trims the grass as he makes another looping pass under the limbo ribbon*



*Pilot Dani Ellison and helper Liam Swarbrick display their Fusion fun flyer on the Barkston runway*



*And what would a model event be without Dave Bishop to provide the commentary? Here is Dave, enjoying a laugh between rounds at Fun Fly*



*Mathew Poots shows off his colourful own design fun fly model*



*A typical fun fly machine: simple, robust and supremely agile*



*Top Fun Fly pilot Martin Bell is another who likes to fly models of his own design*



**Vendors A-Plenty!**

And what would a modelling event be without vendors? The Nats is no exception and the huge vendor area had dozens of tent fielded by suppliers and manufacturers of everything model aviation related. The Traplet booth was also on hand, ably manned by Barry Atkinson and Angela Price who did a rip-roaring trade in Traplet plans and wood packs, as well as back issues of all the company's model aviation magazines. Debuting at the Nats was a brand new product – a very-affordable 3-D printer (more to come on this soon).

**From My Attic To Yours**

And what would a model aircraft event be without a swapmeet? Sunday morning, fellow Traplet editor Kev Crozier and I jostled shoulders with the bargain-hungry multitudes cruising the modelling

equivalent of the world's biggest car boot sale. Judging by the smiling faces of punters carrying away dusty, sun-faded boxes and previously loved/abused airframes, the treasure hunt was successful for many. Must check the attic before I go next year.

**A True Community**

While the events are massively enjoyable, it's the sense of community that makes the Nats so special. Where else can you hang out with a multitude of like-minded people? I particularly enjoyed the free flight scale event that happened on Saturday after all competition flying had ended at 6 pm. We joined the large crowd gathered at the side of the runway to watch the event. The scale creations included many classic biplanes and triplanes, some I/C powered and some

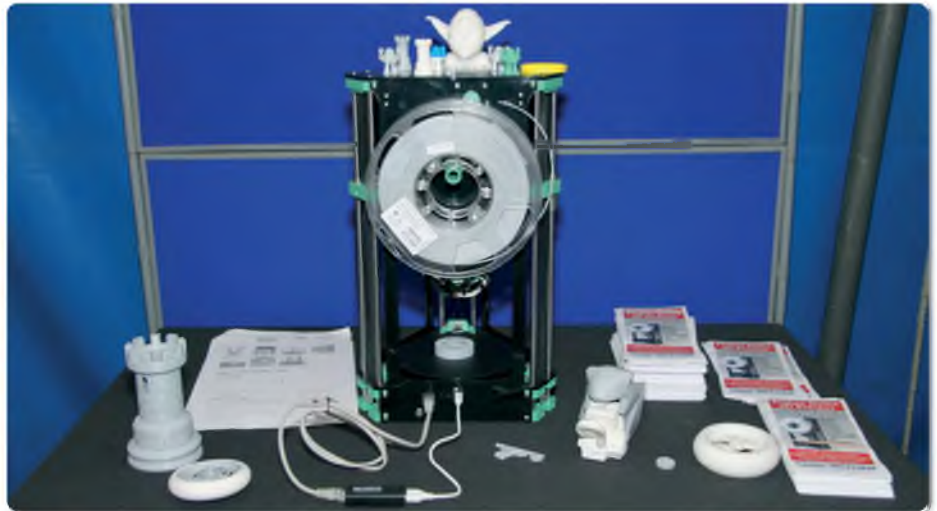
rubber-powered. These fragile beauties were fearlessly hurled by their creators into the teeth of a cold and cruel wind. Upon release the mystery of how well the models were trimmed was revealed to all, as some flight paths were more thrilling than others. The resulting dives and swoops brought yells and shouts from the assembled crowd – some encouragement, some pure terror – as spectators ducked and dodged wayward models. After each and every landing, whether fantastic or frangible, the crowd sportingly applauded the efforts of their fellow modellers. Yes, I guess we are all a little crazy in this hobby. And proud to be so.

If you've never made it to the Nats, you are missing out on part of the magic of this hobby. I'll be there in 2016.

**RCMW**



There were vendors aplenty at the Nats. Here Horizon's Adam shows off a new Horizon model, the Ultimate biplane



Traplet had its usual tent selling plans and woodpacks. This year, however, they had something very exciting to show off – a new, low cost 3-D printer!



The Sunday morning swapmeet was swamped with modellers looking for bargains



See you at next year's Nats!



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# THE UK DRONE SHOW

IS LANDING AT THE NEC ON THE 5TH AND 6TH DECEMBER 2015



The UK Drone Show 2015 – the only public exhibition in the UK for both the consumer and the commercial operators of unmanned aerial vehicles (UAVs) or drones and dedicated to the safe use of drone and UAV technology taking place on the 5th and 6th of December at Birmingham's National Exhibition Centre (NEC).

Supported by the CAA & appealing to the hobbyist & the commercial users of UAV/drones the show includes a number of influential guest speakers and the following:

- Flight training companies including; UAV Academy, EuroUSC
- Manufacturers including; DJI and Parrot
- Insurance companies; Insurance for Drones, Besso and Coverdrone
- Commercial companies; Altitude
- Angel, Eye Sky Group, EuroUSC
- Flying & agility demonstrations, plus try and fly a drone yourself
- The regulators; The CAA, Ofcom and NATS
- The RC flight media and clubs; Flight Camera Action and the BMFA

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PHOTO: XMAS NOV 15



Peter Maw completes his ongoing Fokker DVIII build and adds a gyro system



# SCALE MODEL BUILDING FOR FUN

**C**ontain yourself. Just because the airframe is built don't think all the work has been done on your first scale model. The fuselage needs filling up with electronic stuff and then it can be fully covered.

## Power Train

The power train needs installing, battery boxes need building and servos need hooking up.

Once the servos are connected the next logical step is to install the motor, the speed controller and battery box. Make the battery box longer than necessary so that the battery can be used to act as ballast to achieve the correct balance.

After flight trials it was apparent that my version of the Fokker required the battery to be as close to the F1 former as possible. The Fokker company had amazing foresight, designing the D.VIII perfectly for model electric power. The motor is half cowled to keep it cool, the ESC is protected in the cowl but with cooling holes directly in front of it. The lower part of the F1 former has large cooling holes drilled through it in front of the battery, and the scale exhaust pipe helps warm air exit the fuselage.

The original model was powered by a 0.40 cu.in. four-stroke. As far as an electric installation is concerned this means at least a 500 watt power unit, preferably with a fairly low rpm/volt specification (equivalent to a high torque, low revving

four-stroke motor). An AXI 2826/12 motor with a 4S (14.8 volt) cell meets these needs. It achieves around 80% efficiency according to data supplied by AXI ([www.modelmotors.cz](http://www.modelmotors.cz)). The maximum rpm/volt figure for this motor is 760 and its power output is 547 watts. Therefore, this motor could spin a 12" or 13" prop at around 8,500 rpm; however inefficiencies in the airframe/power train make 8,000 rpm a more likely figure. That will give an airspeed of around 45 mph with a 6" pitch prop or 30 mph with a 4" pitch prop. (Assuming maximum propeller/airframe combined efficiency, which is extremely unlikely. So you can take 20% off these speeds.)

A 40 amp Jeti Advance Pro Opto ESC complements the motor nicely and is attached to the front of the firewall with servo mounting tape. In the interests of safety it is never good practice to use the motor power supply to power the receiver and servos as well. The 100 gram weight penalty of a 2S 2000 mAh LiPo is worth suffering on a model that will have taken at least 50 hours to build. Therefore the OPTO version of this ESC is the correct choice as it is not wired to power the receiver. Other manufacturers supply ESCs which can be forced to act as OPTO ESCs by disconnecting the positive power wire.

Make a battery box large enough to suit a variety of batteries, depending on how you fly. Using a 4S 3300 mAh battery the plane uses between 50 – 60% of the battery



**Holes in the cowl and in F1 former make for a cool running installation**

capacity in 10 minutes flying on a mix of circuit flying and aerobatics with a 12" x 6" prop. 4-Max Purple Power 4S batteries from 3300 mAh to 4500 mAh are all the same length and width; the extra capacity comes from thicker lithium layers.

## The Final Countdown

Once all the bits have been installed the remainder of the fuselage can be covered. The top and bottom of the fuselage are straightforward but the sides have convex



## FOKKER

shapes. These are not compatible with heat sensitive covering materials that shrink to take the shortest line between two points. A 12 mm wide bit of balsa glued to the fuselage side just around the sheeted area will help enormously in helping the Solartex keep its shape. I tried two different ways to get a sharp angle between the fuselage side and the sheeting. Number one was to spread BalsaLoc over the 12 mm wide balsa strip and the sheeted side. This was reasonably OK, although a few areas of the Solartex did not stick perfectly, which could have been because insufficient BalsaLoc was applied. Number two was to iron Solartex strips to the balsa strip and to the sheeted side, and then put the complete side sheet of Solartex in place and iron it on to the Solartex already on the 12 mm sheet. This formed a perfect straight line.

### Let's Get Airborne - Part 1

The great day arrives. Check everything. Check it again. Then make a final check. The maiden flight was by one of the better flyers in our club because the articles need flying pictures! This is actually a moment of dread when writing—you don't want the only flying pictures to be the steep take-off followed by an flip inverted and a crunch into the ground. That is almost as bad as having the bride's eyes shut in all the wedding photos.

Paul Lawton did the flying and spent a few minutes taxiing the model around to get used to its responses. Then he pointed it into wind, ran the motor up to about half power and the take-off run began. There was little directional control until the tail was up and the plane was running level. It lifted itself off the ground happily and climbed away gently. Paul trimmed the plane out on a couple of circuits and reported positive control responses. Right rudder trim was needed, which suggests that side-thrust is required. Running the plane up to full power it accomplished a loop easily and Paul was able to make plenty of low passes at slow speed to allow me to do the happy snaps. Landing approaches showed that the plane is very stable on approach providing speed is kept up. Touch and goes were stable and easy, even in a moderate crosswind. The thing that was obvious was that the plane would be totally unforgiving if the approach was too slow as it would stall.

Once I got my hands on the sticks I found that, despite their small size, the tail control surfaces are amazingly effective and their positive effects make the plane fun to fly. Take-offs and landings are tricky unless the plane is pointing directly into wind and the plane is moving fast enough for the control surfaces to have an effect. The Fokker requires the tailplane to be horizontal for take-off and landing. The tail needs to be up and horizontal as soon as possible on the take-off run and to stay up as long as possible on the landing run. Don't use a wooden prop until you get used to this!

### Let's Get Airborne - Part 2

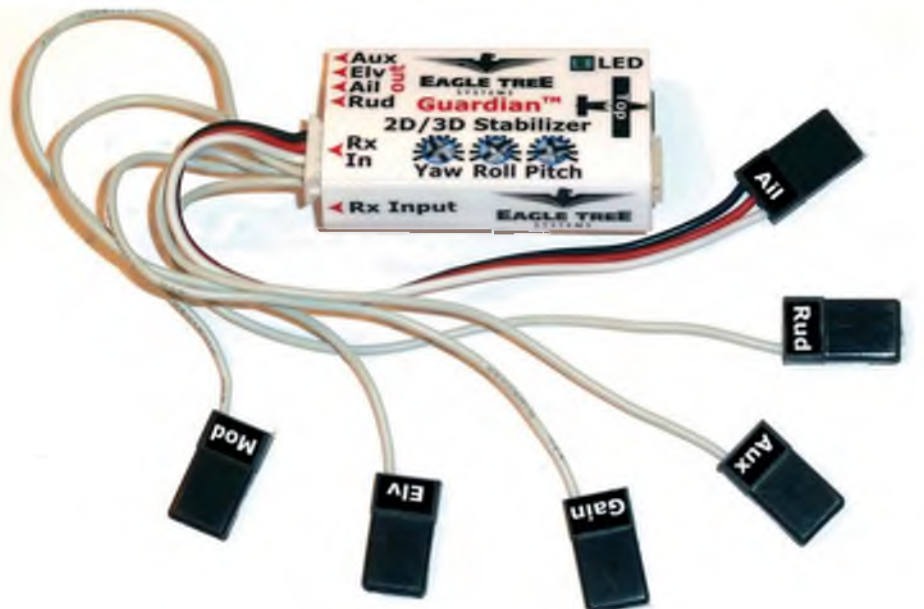
Although Fokker designed a perfect layout for an electric model, from a



Overcoming the problem of fixing heat shrink covering to a convex shape. The extra balsa can be coated with BalsaLoc or a strip of Solartex and then iron the covering into the crease between the side sheeting and fuselage side



If the plane is not taking off or landing in this attitude it will be unhappy



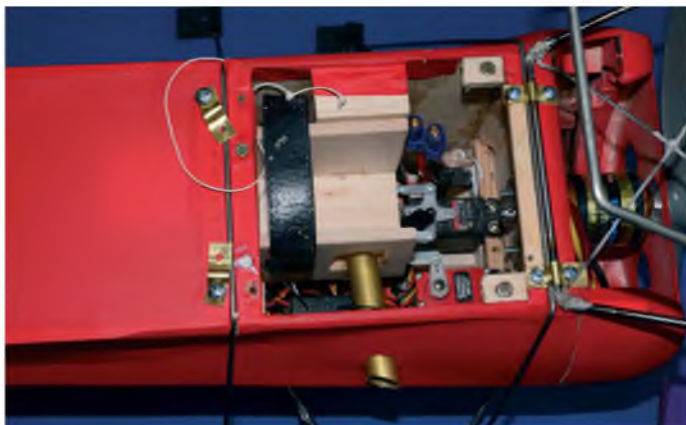
The neat gyro. Note that the wiring harness only has the signal wire for all the servos except the aileron, which also supplies the power to the receiver and servos. Hence it has a maximum 5 amp rating

modeller's point of view they did not do such a good job with the ground handling. For the size of model the wing is a very long way (150 mm) above the thrust line, which means the Centre of Gravity (C of G) is nowhere near it. Any purpose-designed model aircraft will have the C of G low down and close to the centre line of the plane where it causes least disruption. The high C of G can create a pendulum

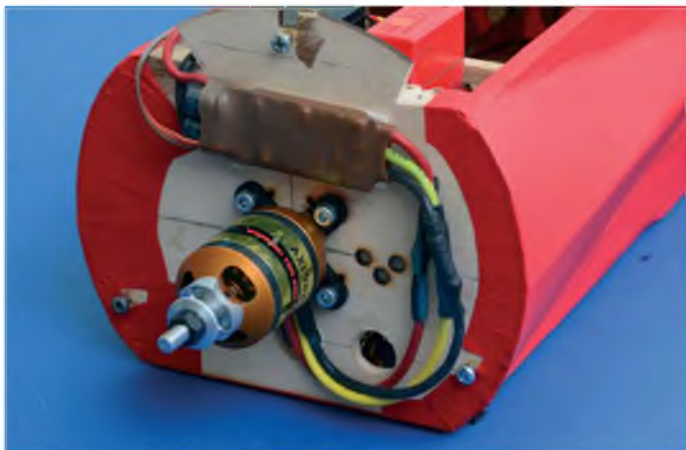
effect when the plane goes from its resting position to its flying attitude on take-off.

The other mistake Fokker made was to have a wide track undercarriage close to the C of G (this was a problem on most full size aircraft of the era). Three problems are the outcome. As the plane swings from static to running mode it risks tipping forward onto its nose before take off, unless you are quick on the sticks. If the

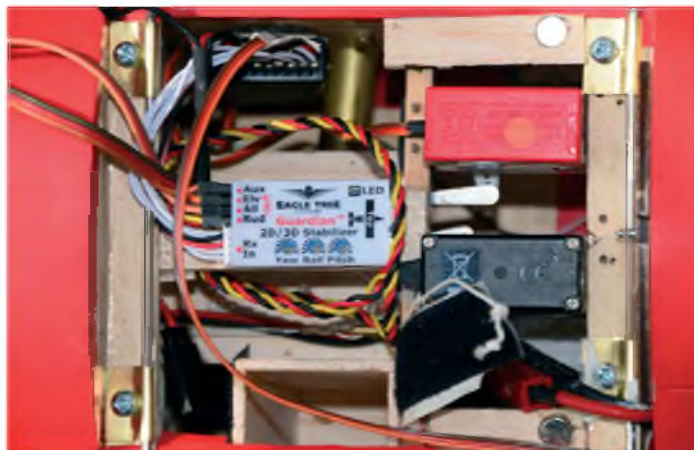




*Everything fits snugly*



*Loads of space and plenty of cooling for the Axi 2826 and JETI controller*



*The Eagle Tree gyro fits nicely into the front fuselage. It is mounted exactly on the C of G*

plane is not pointing dead into wind on the take off run any small deviation in the direction the wheels are running has a minimal auto-corrective reaction (which would normally be caused by the wheels being further forward of the C of G). The result is a significant risk of ground looping. Finally, landings must be made directly into wind otherwise the plane will tip over onto a wing tip.

### **The Solution**

The obvious solution to the landing and take-off issues was a gyro. I had a discussion with Paul Maddocks at Electricwingman, explaining that my only requirement was to keep the plane straight on take-off. He recommended either a Multiplex MULTIGyro G3 or an Eagle Tree Guardian 2D/3D flight stabiliser. I sent my hard-earned cash to him for the Eagle Tree unit as this fitted the available space, and it was fitted in my plane the next morning.

The gyro comes with a comprehensive instruction manual and a wiring harness. The instructions are written in the programming dialect of tech-speak and are mostly incomprehensible to native English speakers. Fortunately their technical support department are responsive and answered my questions within twelve hours. With no advice on initial settings available, it was a matter of playing it by ear.

The word 'Gain' is used throughout the instructions to refer to the speed and amount of response. Too much (high) gain can make the plane oscillate in the air because the gyro over corrects constantly. It

can also be unsafe because the gyro could try to pull the plane out of a steep dive too quickly, resulting in high G forces which could damage the airframe.

The Eagle Tree system checks for oscillations and automatically reduces the value for the gain. In theory, that means it would be possible to set everything at maximum and let the software sort out any problems. However, you should never trust any software to do what it says in a live environment until it has proved itself in less demanding situations (that is why we do range checks with radio sets whenever they go into new models), which means maximum settings are not a safe initial option. Try the Yaw (rudder) gain at 75% as this is going to be working hard to prevent ground looping, and the Pitch (elevator) and Roll (aileron) at 50% gain. The unit also has a master gain control which can be operated from the transmitter to allow any variation in the effect of the gyro from 0% to 100%. This is an over-riding control and applies equally to all three axes. Set the Master Gain to 50% so the rudder gain becomes 37.5%, and the roll and pitch gains both become 25% of their maximum movements. Responsiveness can be changed in flight if necessary.

Off to the field again with the gyro installed and set up and ready to go in something called 2-D mode. A 12 – 15 mph cross wind may not be ideal for flying a small scale model but it was ideal for testing the gyro. A few taxiing runs showed that, not unreasonably, the gyro was unable to control the ground looping at low speed, but as soon as the plane was

moving at a reasonable speed it worked well. Usually I increase power gently on the take-off run, but I found that if around one-third power was put on immediately the gyro takes effect straight away. As there is no need to use the aileron or elevator it is easy to adjust the rudder with minor deflections if necessary.

A slight increase in power lifts the model off the ground in a very scale-like manner. Then put in some elevator and the model climbs away nicely with perfectly level wings. The procedure turn at the end of the take-off climb out was done as normal. Switching the gyro off after the turn left me in total control and there were no adverse consequences from turning it off. Switching the gyro back on for crosswind straight and level flight was brilliant. The plane flew dead straight with no inputs. Doing the same thing at height and lowering the power results in a perfect sideslip. Landings were well controlled and there is much less tendency to tip over at the end of the landing roll-out. This will improve with practice.

Generally I only use the gyro for take-off and landing. The rest of the flight is easy to control and the plane is lovely to fly. Loops, wing-overs, stall turns and reversals are straightforward. The model wants to fight against rolling and fall out of the sky when it is upside down and so a mountain of down elevator is needed. The plane can stall in a turn if there is not enough power on and too much aileron is applied, and it must land at a relatively high speed with the tail up if you don't want it to tip over on the ground. The D.VIII was designed



## FOKKER

to be faster and more manoeuvrable than other planes of its day, hence landing characteristics were not necessarily in the forefront of the designers' minds. As long as the pilot didn't die it could be classed as a safe landing!

Test flights have shown the Fokker to be a very robust model. The motor may seem overpowered, but if you want to do any aerobatics the power is needed. You can potter around at 30% – 40% power for the non-aerobatic bits which gives 10 minutes plus of flying time.

## RCMW

### CONTACTS

#### Axi Motors and Eagle Tree Flight Stabilisation

[www.electricwingman.co.uk](http://www.electricwingman.co.uk)

#### Purple Power Batteries

[www.4-max.co.uk](http://www.4-max.co.uk)

## MODEL WORLD DETAILS

### MODEL INFORMATION

<b>MODEL TYPE:</b>	Parasol wing, near scale monoplane
<b>WING SPAN:</b>	54" (1.37 m)
<b>WING AREA:</b>	437 sq in (0.28 m <sup>2</sup> )
<b>WING LOADING:</b>	26 oz/sq ft (7.9 kg/m <sup>2</sup> )
<b>ENGINE/MOTOR:</b>	0.40 cu in 4-stroke or equivalent electric motor (Axi 2826/12 used with 12" x 6" prop and 40 amp ESC)
<b>CONSTRUCTION:</b>	Balsa and ply
<b>WEIGHT:</b>	5 lb flying weight, including a 4S 3300 mAh LiPo (no weight difference compared to a 0.40 cu in 4-stroke)

### R/C FUNCTIONS

1: Throttle	3: Elevator
2: Rudder	4: Aileron (2 servos)



*As soon as it stops raining we're going flying*



*The gyro works well to keep wings level once flying speed has been attained*



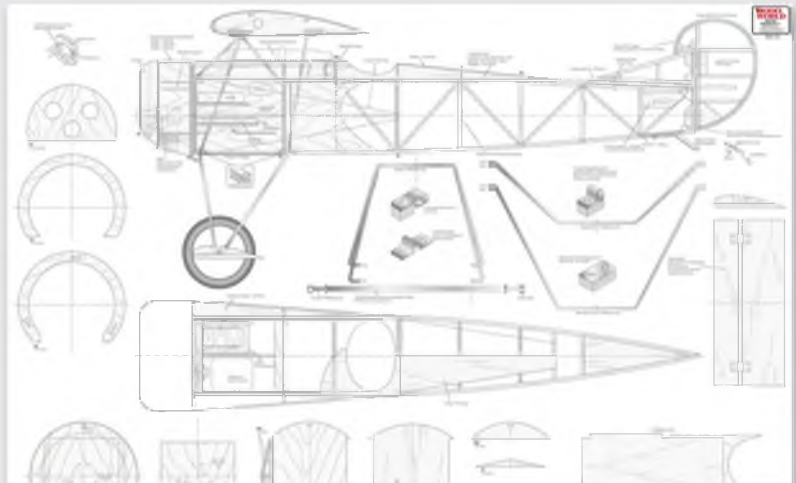
*Nothing else looks or flies like a Fokker D.VIII*

## PLAN DETAILS

<b>NAME:</b>	Fokker D.VIII
<b>BUILD CATEGORY:</b>	Intermediate
<b>PLAN NUMBER:</b>	MW3599
<b>PLAN PRICE:</b>	£20.99 (\$33.99)
<b>WOODPACK PRICE:</b>	£50.99 (\$86.99)

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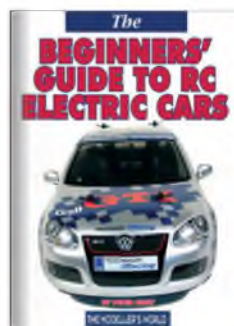


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# FOKKER EINDECKER

*There's more to this scale model of the Fokker EIII than meets the eye, as Mark Beacham found out when he spoke to its owner, Hermann Wirtz*



*Owner and builder Hermann Wirtz (left) and son Alex show off their scratch-built Fokker EIII*





The EIII makes a fine addition to the impressive Dawn Patrol fleet

Since 2007 the Dawn Patrol display team have been demonstrating their beautifully built 1/3 scale WW1 era aircraft at model air shows all over the country. Such is the wide range of different types in the team that I was very much spoilt for choice when it came to taking a closer look. This beautiful Fokker EIII, however, caught my eye for two reasons.

Firstly, though the Dawn Patrol is a UK based team, owner and pilot Hermann Wirtz hails from Jeulich in Germany. Hermann, who has been flying R/C models for over 20 years, explained that his love of WW1 aircraft started back in 2000 when he won a Sopwith Pup kit in a photographic competition. That model was subsequently displayed at the Euroflugtag show in Germany, where he first met the Dawn Patrol team. And the rest, as they say, is history. Herman and son Alex now enjoy touring the UK during the show season as fully-fledged members of the Dawn Patrol.

The scratch-built Fokker EIII took Hermann 18 months to design and build before its maiden flight last year. Scale detailing work was then started, with the cockpit interior still to be completed. A 38 cc Zenoah petrol engine with a 2.8:1 reduction gearbox is used to power the 3.2 m span airframe, and Graupner servos take care of the controls.

I did, however, say there were two things about this model that caught my eye. The eagle-eyed amongst you will have spotted that the EIII does not have any ailerons. Like the full sized aircraft, this model achieves roll control by means of 'wing warping'. As the name suggests, the wings are literally warped using a series of tensioned rigging cables in order to change the amount of lift they produce. One wing warps one way and one wing the other in order to roll the aircraft. The fascinating mechanism that controls the twisting of each wing is located underneath the model and is powered by a single 20 kg servo. Hermann tells me that the mechanism is true to scale and the whole system works as on the full sized aeroplane.

Despite its unorthodox flight controls, Hermann reports that the model is a pleasure to fly and it certainly looks the part as it makes its way leisurely across the

sky. Care does, however, need to be taken during take-off and landing as the wing warping system can cause one wing to stall if large inputs are used.

When asked what it is that he likes about his EIII, Herman replied, "It makes me proud to have a scratch-built model with working wing warping." Indeed, Hermann. You should be very proud!

**RCMW**



The clever wing warping mechanism, powered by a single servo, is true to scale



# HATS AND BOOTS

As the cold weather takes a grip on our flying sites once more it's time to take stock of your winter flying gear to make sure that you keep warm when you venture out for a flying session. Here are some suggestions for keeping your extremities nice and toasty!

**A**t this time of year it is tempting to stay indoors, where it's warm and dry, rather than make the trip to the flying field. But as long as the weather is not too wet or windy there are still plenty of opportunities for some great model flying sessions. However, it is important to wear plenty of layers, so you can peel off one or two to suit the conditions. And it's also vital to keep your hands, feet and head warm too, otherwise you'll soon be wanting to head back home after just a flight or two.

Last winter season we reviewed some good flying gloves from JR Propo and MacWet, so now we are going to turn our attention to some 'Hats & Boots'!

## Head First

It's surprising how much heat you can lose from the top of your head when standing in a farmer's field for a couple of hours (or on the side of a tarmac runway, if you are so blessed!). These new hats from Bridgedale are just the ticket for keeping the old grey cells up to temperature so you can concentrate on your flying, rather than how draughty it is around your ears! The samples we received cover three 'weights'.

**Duo Lite** is a lightweight unisex hat that is also ideal for wearing underneath another hat, such as a sport cap, so you can add an extra layer of warmth whilst still wearing your favourite model flying headgear. Available in 'one size fits all' (as are all the hats in this review), the Duo Lite provides a comfortable cap for autumnal flying. But it is not that deep so the bottom half of your ears may still be exposed. Therefore you may find yourself reaching for something a little more substantial when those cold winds really start to blow across the patch.

However, if you are thinking of nipping out for a quick fly between rain showers

this could be the hat for you as it is largely made from a material called 'drirelease', which is a patented blend of synthetic and natural fibres that moves moisture quickly and reduces drying time. This fabric is also embedded with FreshGuard to neutralise odours so it is perfect for keeping in the car for emergency use when conditions are a bit nipper than expected. Duo Lite is available in Grey or Light Blue.

**Pulse** is a mid-weight hat with a fleece lining. It features 50% Merino wool content and so it is warm and soft to wear. Merino wool is said to have excellent thermal and moisture control properties, and in our tests the Pulse certainly proved to be very comfortable to wear over the course of a flying session.

Although it is a deeper hat than the Duo Lite it still left the lower half of our ears exposed. However, for most winter flying conditions, unless you like to brave severe wind chill factors, it provides a comfortable balance between keeping your head warm and being light and unobtrusive to wear.

Pulse is available in Pink, Blue or Grey.

**Chunky** is a thicker, woven style hat that will be appreciated most during the coldest winter months. As with the previous hat it is fleece lined and includes 50% Merino/Laine Merino wool in its fibre content. It is very warm to wear and can be pulled down right over the ears, so this would be our first choice for windy weather flying, such as when slope soaring.

Chunky is available in Blue, Brown or Grey.



Look out for the Bridgedale packaging at your nearest outdoor clothing retailer



All the Bridgedale hats tested can be hand washed at 30°C, and all come with a one year guarantee. For more details and to find a stockist in your area please visit the Bridgedale website at: [www.bridgedale.com](http://www.bridgedale.com)



**Comfy Feet With Camminare**

With our heads kept nice and warm let's turn our attention to the other end of our body.

Camminare are a Polish manufacturer of footwear and other products made from EVA (Ethylene Vinyl Acetate). Their EVA wellington boots are durable, waterproof and protect against low temperatures (down to -30°C!). They are also extremely light compared to conventional rubber wellies, which makes them comfortable to wear for long periods such as when out flying an R/C model.

We tested a pair of their Forester wellies. With these boots you can dispense with your usual pair of woolen oversocks as they come with a sock style liner made from a felt material. Besides keeping you feet warm and dry the liners can easily be removed and washed (at a maximum 40°C). Further heat retention is provided by flexible cuffs at the top of each boot, which can be drawn up close to your trouser legs using the toggles provided. The cuffs also help prevent the ingress of water should you be unlucky enough to be caught in a rain shower whilst out flying.

The deep treads on the soles of each boot provided good grip during soggy conditions at our local flying field, whilst the EVA material proved to be true to its claims by keeping our feet dry and well insulated from the cold, wet grass surrounding the strip.

Besides Forester wellingtons, Camminare produce a wide range of other boots and footwear. You can see the full range by visiting their website at: [www.camminare.pl/en/produkty](http://www.camminare.pl/en/produkty)

Our pair of Camminare Forester wellington boots were supplied by Emerge Sports of Sheffield. For further details about UK availability and pricing please contact: [nick.m@emergesports.eu](mailto:nick.m@emergesports.eu)

**RCMW**

*Camminare boots feature a removable lining with a stiffened insole in the form of a sock*



*Camminare Forester wellingtons are moulded from lightweight EVA*



*The cuff at the top of each boot can be drawn in using the toggle provided*



*No more oversocks are required thanks to the removeable liner*



# REPRAPPRO FISHER

*Mal Luff tests a 'Build It Yourself' 3-D printer that yields smooth models at a budget price*

I've been using 3-D modelling and animation graphics software for many years. Its capacity to generate artwork and animations of objects or concepts would be difficult – often impossible – to illustrate in any other way. But the capabilities of this type of software go much further; for example, designing structures and components to be made on laser cutting machines and now 3-D printers.

3-D printers have been around for a few years now, but are becoming increasingly accessible and cost-effective. Whilst top-end machines can cost several thousand pounds, there are now entry-level printers available for only a few hundred pounds. And that's where the RepRapPro Fisher comes in.

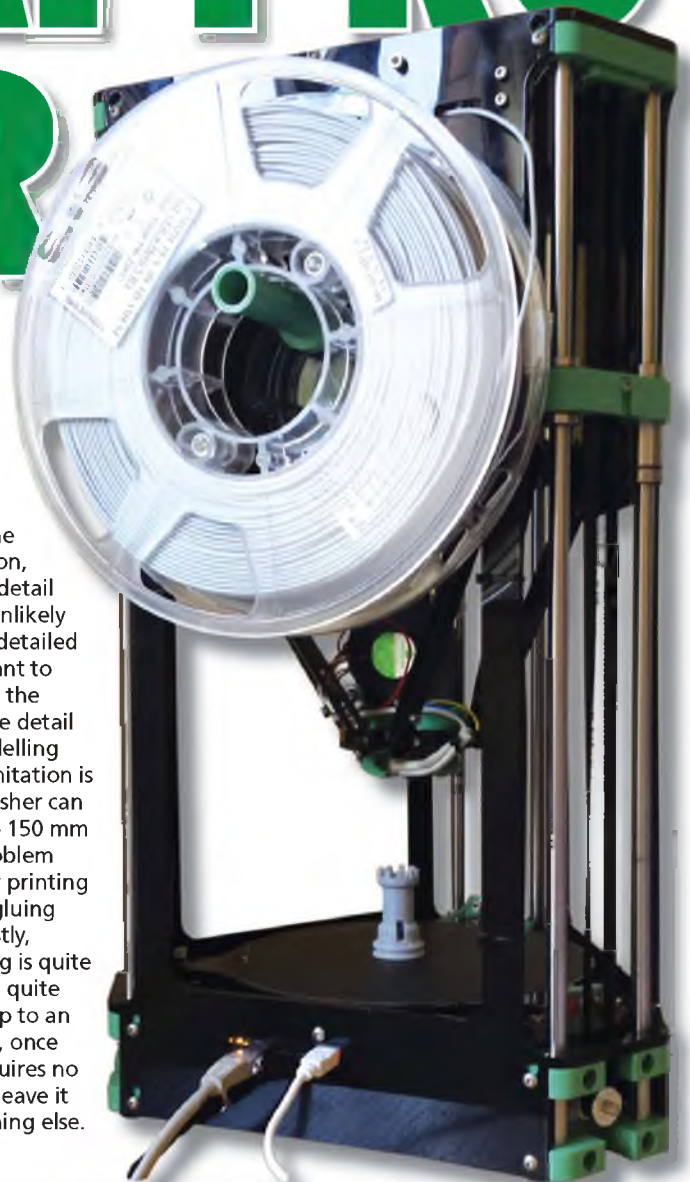
RepRapPro specialise in open-source printers, sold mainly as kits to be built, adapted and customised by the user. The Fisher is intended squarely as an entry-level machine and many of the structural components are themselves produced on a 3-D printer. The printer offers simple assembly, auto calibration and high-speed motion. It's currently available as a beta version which is fully functional; however the design is likely to evolve a little before final release. It is possible to buy the complete kit or just the metal, electronic and acrylic parts, making the 3-D printed parts yourself. Other models in the RepRapPro range include features such as a larger printing area, a heated bed and the option of having two print heads.

## What's It For?

Before I describe the assembly and operation of the RepRapPro Fisher it's worth thinking for a moment about what modellers might possibly make using a 3-D printer. The answer is just about anything, whether structural or mechanical. For example, dihedral braces, engine mounts or undercarriage bearers (3-D printed parts are light but extremely strong) or purely cosmetic items such as dummy engines, seats, instrument panels, weapons and other scale details. You can even use them to make patterns for large vac-formed or fibreglass parts like engine cowlings or canopies, so there's enormous potential. What's more, once you've got the print file

you can print as many parts as you like.

But before you get too carried away there are limitations you need to be aware of. The first is a limited resolution, meaning that very fine detail or very small parts are unlikely to print well. For those detailed parts you'll probably want to print the bulkier part of the object, then add the fine detail using conventional modelling techniques. The next limitation is size. For example, the Fisher can only make objects up to 150 mm x 180 mm. If that's a problem you can always consider printing objects in sections and gluing them together later. Lastly, there's time. 3-D printing is quite a slow process and even quite small objects can take up to an hour to print. Of course, once you set it running it requires no supervision, so you can leave it and get on with something else.



*The RepRapPro Fisher kit comes securely and neatly packed in a sturdy cardboard box*

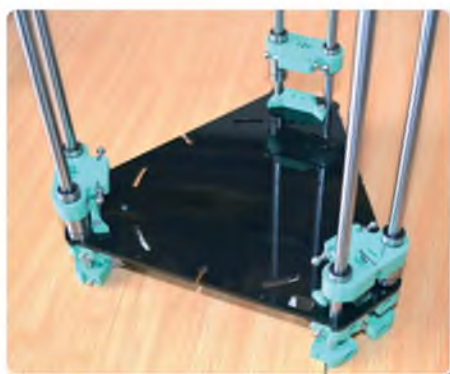




Ready to start assembly using the online instructions



The motor and carriage assemblies taking shape



The triangular shape is obvious as the ground bars and motors are attached to the base

### Building The Fisher

The RepRapPro Fisher arrives securely packed in a sturdy cardboard box. All the parts are clearly labelled, with the nuts, bolts, screws and washers in re-sealable polythene bags. One thing you won't find are any instructions, as these are all published on the RepRapPro website (<https://reprappro.com>). You could print them out, but it's better to use them online as you build because you can then expand the reference photographs when you need to (which is often). It's essential to carefully study the complete build instructions before beginning, as they highlight the tools, equipment and materials you'll need to have available. You're likely to have most of what you need already, but there are one or two items that you might need to borrow or buy and it'd be frustrating to be held up by not having them to hand. I've read of people assembling the printer in a few hours, but I'd say that to avoid rushing and potentially making mistakes you should probably allow a couple of days.

Begin by unpacking the box and laying out the parts bags tidily in a designated 'stores' area that is located away from the build area. Each section of the build lists exactly which parts (and how many of each) are needed to complete it. Remove the parts required for the current section from their bags and put them in the build area. Then re-seal the bags and return them to the 'stores' area. That way you'll keep things tidy and organised. It's a good idea

to use a craft mat or similar for the build area as it will be both non-slip and protect the work surface. Most of the assembly work is screwing together nuts and bolts, but some of the 3-D printed parts may need a little trimming and tidying with a craft knife or fine sandpaper.

The build instructions are comprehensive and are accompanied by detailed photographs and diagrams. It's very important that these are followed exactly, so read, look and read again to make sure you understand exactly how the parts fit together. If you refer to the photographs and double-check that your assembled parts look exactly the same you won't go wrong. The black acrylic parts have a protective film on both sides that needs to be removed before assembling them. Take it from me that it's extremely tedious to have to dismantle a part you've just made because you forgot to remove this film! The other thing to mention about the acrylic parts is that whilst they're perfectly suitable for their job they can break if mishandled, so treat them with care.

As you progress from the relatively simple mechanical assembly to installing the electrical and electronic parts it becomes even more important to follow the instructions carefully. Mistakes here can cause serious damage to the printer, so once more you should check and check again to be absolutely sure that everything is as it should be. You'll find that it helps to label the X,Y and Z axis motors, end-stop



The acrylic sides provide stiffness to resist twisting. Remember to peel off the protective film

micro-switches and wiring harnesses to ensure that they are connected correctly. Correctly connecting the plugs from the various electrical components to the Duet circuit board is a vital step and should be straightforward, but there are pitfalls if you haven't read the instructions carefully and studied the relevant photographs. Despite checking carefully (or so I thought) I still got one of the connections wrong and it took the kind assistance of RepRapPro to sort it out. The moral of the story, which I make no apology for labelling, is that the instructions are 100% accurate, so if your assembly contains mistakes you know who is to blame!





*Starting to assemble the effector head*



*A close-up of the assembled Hot End showing the heater block, extruder nozzle and air duct*



*The completed Hot End mounted on its connecting rods. Correctly wiring the heater, thermistor and cooling fan is a critical step*



*The rear panel connectors to the Duet board. From left to right: DC power, Ethernet, MicroSD, USB*



*Follow the wiring diagram carefully when connecting components to the Duet board*

**Commissioning**

Powering up the printer for the first time is a big moment and once again the instructions will take you through the process of testing to ensure that everything is working correctly. The key thing to check first is that the cooling fan comes on while the heater stays off. If either of those things is different on your printer, disconnect power immediately and check your wiring. Another useful check is to look at the LED's on the circuit board. Four LED's should be on, one each for the X,Y and Z axis End Stop micro-switches (each should go off if you close the relevant switch) and one for the printing base (again, this should go off if you press down on the base). To operate the printer you need to connect it to a computer via either the Ethernet or USB ports on the Duet board. The commissioning section of the instructions explains how to do this, and once control is established there are a number of further checks to ensure all the systems are

working correctly. By the end of this section you'll have completed the build and the printer will be ready for use.

**Printing**

Objects to be printed are stored on the micro SD card. You'll find a test object already available called 'robot' which is good for your first print. It creates a small robot figure that will print in about 10 minutes. The printer is fairly quiet in operation (roughly similar to an inkjet printer) but of course it operates for a much longer time. No user intervention is required during printing unless you want to change the colour of the media.

The most important part of printing is the very first layer that is in contact with the print base. It's essential that this layer is complete with no gaps or parts missing and that it is firmly stuck to the bed. If the printed part comes loose from the bed during printing and starts to move about you'll have to abort the print and try again.

Generally the reason will be that there's insufficient surface area in contact with the base, and as it has cooled it has contracted slightly and cracked off. To prevent this you can make the area in contact with the base larger, or set the control software to print a large, thin base layer (known as a brim) first and then print the object onto it. The brim is then cut away after printing. More advanced printers have a heated bed which keeps the whole object at a stable temperature until printing is complete.

**Creating 3-D Models For Printing**

I just mentioned slicer software, which you may never have heard of, so this is a good time to describe the workflow required to create the files needed for 3-D printing.

There are a large number of websites where you can download models for 3-D printing, but unless you really want to print endless snowmen and chess pieces they're pretty useless. The only way to get exactly



what you want is to design it yourself using one of the many 3-D modelling software packages available. Some, like Blender for instance, are free and open source, and a quick Internet search will reveal lots more. Which software you use is very much a personal choice. 3-D modelling itself is a cross between engineering and artwork, which I find endlessly enjoyable. If you've never done it before you'll find lots of instructional videos on the web that should get you started. For what it's worth I'd say:

1. Break your subject down into basic solids (cubes, cylinders, spheres etc.) and modify/unify them to create the shape you want.

2. Be accurate. A messy mesh will be difficult to work with and will give unpredictable results. If you haven't thought about geometry since school now's the time to brush up on it.

3. It's a good idea to make a 'parts box' folder containing 3-D model nuts, bolts, screw heads, rivets etc. so that you're not constantly remaking them.

4. Save versions frequently, so that if you go wrong you can quickly revert to an earlier version.

5. Be wary of downloaded 3-D models that were designed for illustration/animation work as the modelling methodology is very different. The subject may be just what you want, but it will

probably need so much work to prepare it for 3-D printing that it would be easier to start from scratch.

6. Bear in mind that 3-D printers have minimum resolution, so very thin or fine parts are unlikely to print successfully, or will be structurally very weak.

7. Your mesh must be a cohesive solid made from joined up triangular facets (three-sided polygons), with no gaps between them and no missing facets.

8. There are no true curves in 3-D modelling. Everything is made up from flat triangular facets, so to achieve a curved surface you'll need to increase the number and reduce the size of the facets in a curved surface beyond the printer's ability to resolve them as separate straight lines.

9. Complex objects will probably be better printed in separate parts and assembled afterwards, although it is possible to print mechanically viable assemblies as one mesh.

10. Your mesh needs at least one flat side which will lie on the print bed. If your model does not have one you'll have to divide it into sections that do.

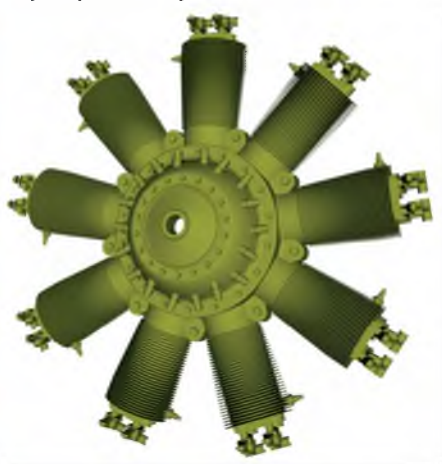
11. Be sympathetic to the way the printer extrudes media in layers one on top of the other, and arrange your mesh to avoid unsupported overhangs where possible.

Like any other type of modelling, accurate 3-D modelling requires good quality reference material: ideally a three-view drawing and plenty of photographs. It's best to model in full size dimensions, and then, when the mesh is complete, it's easy to reduce it to the scale needed.

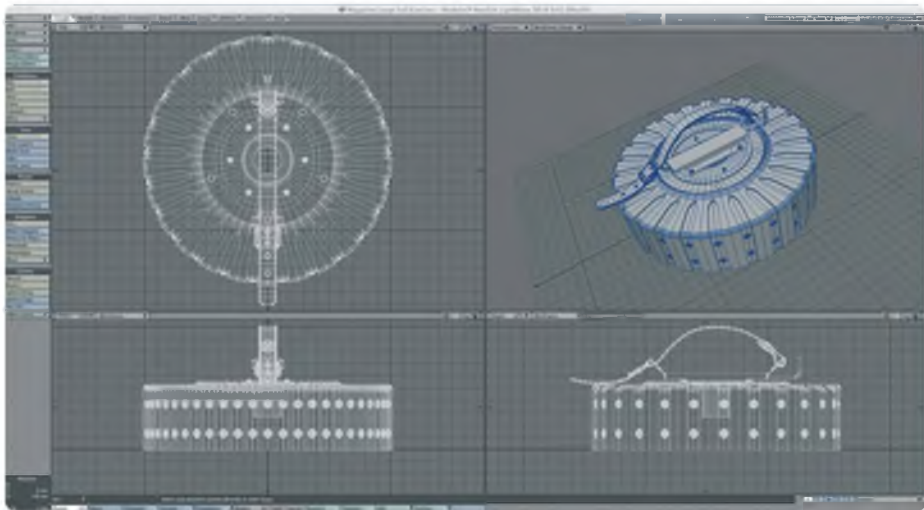
Having finished designing your model you need to export it in a file format that the slicer software can read. RepRapPro recommend using Slic3r (<http://slic3r.org>) which will work with .obj and .stl files, so make sure that your 3-D modelling software can export one of these. Incidentally, when you import your model into Slic3r you may find that the dimensions and orientation are different from the way it appeared in your modelling software. For example, some 3-D modelling software uses the X-axis for width, the Z-axis for depth and the Y-axis for height, but in 3-D printing the X-axis is width, but the Y-axis is depth and the Z-axis is height. It's easy to correct this by rotating the mesh by 90° around the X-axis either in your modelling



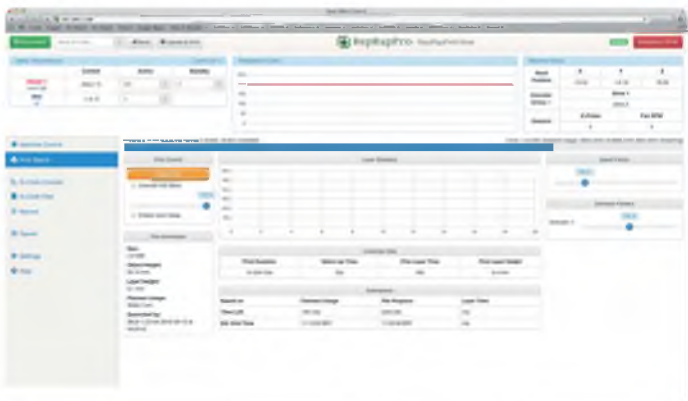
*This close-up of a 3D printed quadcopter chassis shows how the shell is created then filled in*



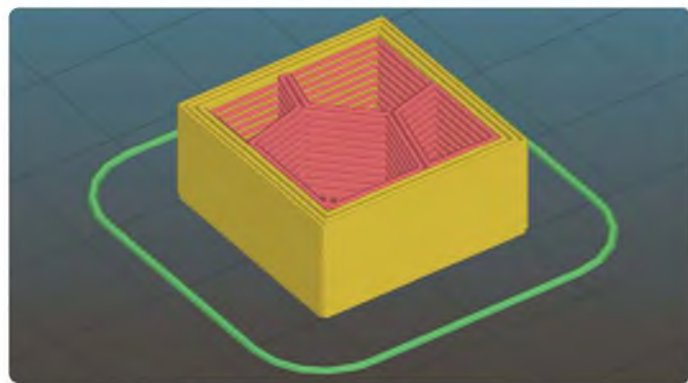
*When painted and detailed this mesh of a dummy Clerget 9B engine would look fabulous on a whole range of Allied WW1 model aircraft*



*Making a 3D model of a 1/4 scale Lewis Gun magazine. The software is NewTek Lightwave 3D*



*The printer control panel*



*In Slic3r you can adjust the wall thickness, infill pattern and many other settings*



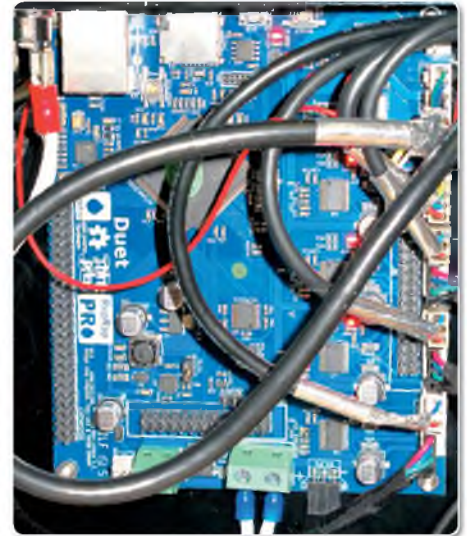
## 3D PRINTER

software or in Slic3r. Similarly, you might find that a mesh that you designed to be 30 mm wide is only .03 mm wide in Slic3r. Again, a quick re-size x1000 in Slic3r will solve the problem. The Slic3r software prepares your model for printing by defining such things as layer thickness, infill density, internal structure and many other factors. You can also select several different objects or multiple copies to be printed at the same time provided they fit into the permitted printing area. Make sure you have the correct printer driver selected in Slic3r – the drivers for the RepRapPro Fisher need to be downloaded and installed. Load your object into Slic3r, and when you're happy that its size, orientation and other settings are as required the next stage is to generate the G-code and load it onto the Fisher microSD card. Remember that the G-Code you generate will only work properly on the model of printer selected in Slic3r. All that remains is to select the G-Code in the machine control interface and start printing.

If this had been an R/C model aircraft we'd now be talking about the flying experience, but the fact is that once built and functioning correctly 3-D printers are really no more interesting to operate than any other type of printer. What is interesting is designing the 3-D models to be printed, but that's a whole new subject and I've only had room to give a brief overview of the process. In future we'll publish a feature on 3-D modelling, but as I mentioned earlier there's lots of information and videos on the web, so jump in and have a go.

We've only had the Fisher for a few weeks and so we are still building experience

with it ourselves. However, so far we are enormously impressed with both the machine and the support we've had from RepRapPro, with any problems all being pretty much self-inflicted. Provided that you follow the instructions carefully it is easy to build and simple, quiet and effective in operation. In the coming months we'll be looking at its true capabilities and you may well see 3-D printed parts and accessories for some of our R/C model aircraft and boat plans become available in the Traplet online shop. If the object you want to print is beyond your abilities to 3-D model, please contact us to discuss using our services to create what you want. And if you decide to buy a printer yourself, you'll certainly find many uses for it not only in modelling but as a DIY household tool. Finally, if you've got any questions about 3-D modelling and 3-D printing why not put them on [www.thehobbyhub.com/rcguru](http://www.thehobbyhub.com/rcguru) where we'll do our best to answer them. **RCMW**



On power-up you should see five LEDs lit on the PCB. The one by the ethernet socket and from left to right: the printing base and the X, Y and Z end-stop microswitches



A 1/4 scale lewis gun fresh from the printer. Even a small 3-D printer such as the Fisher can make fairly large items if they're done in sections. A little light sanding and filling, together with skilful painting would make this a very convincing addition to a WW1 fighter

# MODEL WORLD DETAILS

## PRODUCT INFORMATION

**NAME:** Fisher 3-D Printer  
**MANUFACTURER:** RepRapPro  
**DISTRIBUTOR:** Sarik Vacform  
**WEBSITE:** [www.sarik-vacform.com](http://www.sarik-vacform.com)  
**PRICE:** £298.00

## PRINTER SPECIFICATION:

**BUILD VOLUME:** 150 mm diameter,  
180 mm height  
**NOZZLE DIAMETER:** 0.4 mm

## Mechanics:

- 12.5um resolution in all axes
- Removable print surface
- Spring loaded kinematic locations, 1um repeatable positioning and bed probing
- Direct drive extruder with all-metal stainless steel nozzle

## Electronics:

- Duet electronics
- 32 bit ARM cortex microprocessor
- Ethernet and USB interface
- On-board microSD storage

## Firmware:

- Automatic calibration of print surface and delta parameters
- Smooth real time motion
- Internal webserver for access via ethernet, with DHCP and netBIOS

## Software:

- Machine controlled via web interface
- Prints gcode files provided by Slic3r and other open source slicing software

# WIN a RepRapPro Fisher 3D Printer

Dont miss the December issue of RC Model World for your chance to WIN a RepRapPro 3-D Fisher printer.

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## This month's featured plan



### HAWKER HURRICANE MK.1 (70")

Designer Brian Taylor	
WINGSPAN	70"
SCALE	1:6.8
ENGINE	75 - .80 IN. 4-STROKE

PLAN REF MW3333

£21.99 + P&P/S&H

LASERCUT WOODPACK REF WP3333

£80.99 + P&P/S&H

This aircraft became renowned during the Battle of Britain, accounting for 60% of the RAF's air victories in the battle, and served in all the major theatres of the Second World War. This 70" scale version designed by master-builder Brian Taylor has been replicated in fine detail on these 2 large sheets of well-detailed plans showing working flaps and retracting undercarriage.

\* Image shows finished replica of model. Additional parts are required.



**To celebrate the 75th anniversary of World War Two's Battle of Britain, we are offering the fantastic Hawker Hurricane MK.1 (70") full set including Plan, Lasercut Woodpack, Spinner, Cowl and Canopy for only £180.94!**

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### HAWKER HURRICANE (25")



Designer: Adrian Britton		Difficulty **
WINGSPAN	25"	
WEIGHT	102	
RADIO FUNCTION	3	

PLAN MW3021	£12.99
WOODPACK WP3021	£37.99
<b>FULL SET SET3021</b>	<b>£45.09</b>
<b>SAVE £5.89</b>	

### GLOSTER GLADIATOR (56")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	56"	
SCALE	1:6.91	
RADIO FUNCTIONS	4-5 FUNCTION	

PLAN MW3344	£21.99
WOODPACK	£94.99
ACCESSORY SET	53.97
<b>FULL SET SET3344</b>	<b>£167.10</b>
<b>SAVE £3.85</b>	

### N.A. P-51D MUSTANG (69")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	69"	
RADIO FUNCTIONS	6	
SCALE	1:6.4	

PLAN MW3325	£21.99
WOODPACK WP3325	£64.99
ACCESSORY SET	£110.94
<b>FULL SET SET3325</b>	<b>£194.42</b>
<b>SAVE £3.50</b>	

### SUPERMARINE SPITFIRE MK.IX



Designer: Adrian Britton		Difficulty **
WINGSPAN	27"	
POWERSOURCE	SPEED 400	
RADIO FUNCTION	3	

PLAN MW3034	£12.99
WOODPACK WP3034	£30.99
<b>FULL SET SET3034</b>	<b>£37.38</b>
<b>SAVE £6.60</b>	

### DH98 MOSQUITO FB.VI



Designer: Brian Taylor		Difficulty ****
WINGSPAN	71"	
SCALE	1:9.15	
RADIO	6 FUNCTION	

PLAN MW3345	£23.99
WOODPACK WP3345	£57.99
ACCESSORY SET	£116.96
<b>FULL SET SET3534</b>	<b>£194.46</b>
<b>SAVE £4.48</b>	

### MESSERSCHMITT BF110C (71")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	44"	
LENGTH	40"	
SCALE	1:6	

PLAN MW3326	£23.99
WOODPACK WP3326	£102.99
ACCESSORY SET	£47.98
<b>FULL SET SET3326</b>	<b>£167.18</b>
<b>SAVE £7.78</b>	

### HAWKER TYPHOON 1B (72.75")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	72.75"	
RADIO FUNCTIONS	6	
SCALE	1:6.86	

PLAN MW3339	£21.99
WOODPACK WP3339	£107.99
ACCESSORY SET SET3339	£77.97
<b>FULL SET SET3339</b>	<b>£203.29</b>
<b>SAVE £4.66</b>	

### MESSERSCHMITT ME163 KOMET (49.75")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	49.75"	
SCALE	1:6.45	
RADIO	4 FUNCTION	

PLAN MW3347	£16.99
WOODPACK WP3347	£50.99
COWL & CANOPY	£19.98
<b>FULL SET SET3347</b>	<b>£79.17</b>
<b>SAVE £8.80</b>	

### SUPERMARINE SPITFIRE 1A (69")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	69"	
SCALE	1:6.4	
RADIO FUNCTIONS	6 FUNCTION	

PLAN MW3334	£21.99
WOODPACK WP3334	£107.99
ACCESSORIES	£78.96
<b>FULL SET FSET3334</b>	<b>£204.24</b>
<b>SAVE £4.70</b>	

### N.A. T-6 TEXAN/HARVARD (94.25")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	94.5"	
SCALE	1:5.33	
ENGINE	1.20 TO 1.50CU	

PLAN MW3336	£26.99
WOODPACK WP3336	£117.99
ACCESSORY SET CA3336SET	£78.97
<b>FULL SET SET3336</b>	<b>£214.01</b>
<b>SAVE £9.94</b>	

### MESSERSCHMITT BF109F (61")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	61"	
SCALE	1:6.4	
RADIO	6 FUNCTION	

PLAN MW3348	£19.99
WOODPACK WP3348	£77.99
ACCESSORIES	£63.97
<b>FULL SET SET2793</b>	<b>£158.30</b>
<b>SAVE £3.65</b>	

### REPUBLIC P-47D THUNDERBOLT (RAZORBACK) (76")



Designer: Brian Taylor		Difficulty ****
WINGSPAN	76"	
SCALE	1:6.7	
RADIO	6 FUNCTION	

PLAN MW3335	£23.99
WOODPACK WP3335	£117.99
ACCESSORIES	£72.97
<b>PLAN &amp; ACCESSORY SET</b>	<b>£205.21</b>
<b>SAVE £9.74</b>	



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### MESSERSCHMITT BF109 (24")

Difficulty \*\*



Designer: Adrian Britton	
WINGSPAN	24"
RADIO	3 FUNCTIONS
MOTOR	SPEED 400

PLAN MW3047	£12.99
WOODPACK WP3047	£31.00
<b>FULL SET SET3047</b>	<b>£39.59</b>
<b>SAVE £4.40</b>	

### MESSERSCHMITT ME 262

Difficulty \*\*\*



Designer: Phil Noel	
WINGSPAN	42.5"
LENGTH	4 - 7
RADIO FUNCTIONS	3

PLAN MW3666	£21.99
WOODPACK WP3666	£86.99
CANOPY CA366CY	£6.99
<b>FULL SET SET3666</b>	<b>£102.67</b>
<b>SAVE £13.30</b>	

### GRUMMAN F4F WILDCAT

Difficulty \*\*\*



Designer: Shazard Mohammed	
WINGSPAN	36"
SCALE	01/12/2015
WEIGHT	24.50Z

PLAN MW3593	£13.99
WOODPACK WP3593	£59.99
<b>FULL SET SET3593</b>	<b>£66.59</b>
<b>SAVE £7.39</b>	

### WESTLAND LYSANDER

Difficulty \*\*\*



Designer: Keith Humber	
WINGSPAN	63"
WEIGHT	4LB
SCALE	1:9.5

PLAN MW3534	£21.99
WOODPACK WP3534	£79.99
<b>FULL SET SET3534</b>	<b>£97.78</b>
<b>SAVE £17.79</b>	

### DEWOITINE D.510

Difficulty \*\*



Designer: John Blakey	
WINGSPAN	53"
WEIGHT	3LB
SCALE	1:9

PLAN MW3507	£13.99
WOODPACK WP3507	£82.99
<b>FULL SET SET3507</b>	<b>£87.28</b>
<b>SAVE £9.70</b>	

### P-51D MUSTANG

Difficulty \*\*



Designer: Tony Nijhuis	
WINGSPAN	42"
WEIGHT	2LB 40Z
MOTOR	500 SIZE

PLAN MW3146	£12.99
CANOPY CA3146CY	£6.99
<b>FULL SET SET3146</b>	<b>£17.98</b>
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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).



# UPDATING A CLASSIC

Chris Freeman and his fellow club members have fun going back to basics with their Vic Smeed designed Tomboys



Tomboy squadron ready for take-off

In April last year one of the members of the Vintage Model Aircraft Society, who had emigrated to New Zealand, gave us an update of a one design competition that they have at their club in the Antipodes and suggested we do something similar in South Africa. Along with the email was a copy of the rules they used and the plan for the Vic Smeed Tomboy. I was tasked with evaluating the design and getting parts laser cut so that semi kits could be made available to members. Alan (laser cutter supreme) and myself evaluated the design and decided to make a few changes to make the Tomboy more suitable for our use.

## Tomboy On Steroids!

The biggest change made was to enlarge the airframe by 10% so that standard 9 g servos and normal Solarfilm covering could be used without adversely affecting the performance. Wing construction was also changed so that turbulator spars and two main spars with shear webs were used, as the single spar shown on the plan was prone to failure in our weather conditions. In summer we can experience very strong thermals that require some heavy handed flying to get them down, so this is not a good time find out that the wing design is not strong enough.

We also reduced the dihedral a bit to reduce the Dutch roll normally seen on this type of aircraft. Alan did his magic on the design so that we could maximise the wood usage to reduce the cost of the aircraft. Cost was a major factor as many of the Vintage Model Aircraft Society members are retired and have limited funds to spend on hobby related items.

## Going Into Production

We also approached a local hobby shop to assist with stocking the required items

to complete the airframes as South Africa does not have a reliable postal system, so internet and mail order shops are not just a click away. This also resulted in most of the Tomboys having the same equipment so all builders have an equal chance.

Alan advised that to have maximum utilisation of wood would mean that the semi kits would be made in batches of eight and gave me a list of the wood needed. I soon received the first set of parts so that I could build a prototype to ensure that the part fit was correct and so that I could also do a build blog and instructions for the build. The first aircraft was built, test flown and found to be successful as it was easy to build and fly. Feedback was given to Alan, who updated the parts, and to the hobby shop to confirm what was needed for the stock set up.

Eight semi kits were made and the response was so good that a further two batches were quickly made. We soon had our first monthly Tomboy competition that involved a mass take-off with a 20 second motor run, with the last one down being the winner. Fleming (the New Zealand instigator) sponsored the competition trophy, which soon became highly sought after.

The Tomboy is not a model I would have normally built but I have to admit that it flies very well for the simple airframe that it is. Quite a few have been built by members who had never built a model before or as their first three-channel aircraft.

## Tweaks And Tips

I was intrigued to see how all the Tomboys differ, as builders incorporated their own changes to the basic design. The one real revelation was that the final weight was not as critical as I would have thought. Pilot skill and the ability to trim the airframe for maximum altitude



Woodpack and plans

climb are the most important aspects and then smooth flight afterward is next in importance. In wind it can be an almost straight up and then glide down without turning once! Pilots have also made a few tweaks to the C of G, down thrust and wing incidence to ensure the maximum climb under power.

One of the local club committee members allows the Vintage Model Aircraft Society to use his facilities. He was given a kit and challenged to have it ready for the next event in a month's time. Jon likes large-scale aircraft and turbines, and has a





Fierce competitors assemble for another test of skill

rule in his workshop that only two metre and larger aircraft are allowed in, so the Tomboy was a real downgrade for him. He found the small airframe fragile and difficult to work on as he was used to working on the larger aircraft.

His Tomboy was made with pull-pull cables and stand-offs for the motor, just as he does on his larger aircraft. Jon finished his Tomboy just in time for the next meeting and test flew it on the day of the event. He found the Tomboy very difficult to control under power and pronounced the flying characteristics as diabolical.

After the initial test fright (sic), Jon spent some time observing other what the

other guys had done to their models. He then incorporated some downthrust to his Tomboy, with the result that he now thought it flew magnificently! He won the next event with the longest glide on the day.

### The Joy Of Simplicity

We have now been flying the Tomboys for a year, with 48 semi kits having been made. The average glide after a 20 second motor run is around 5 minutes and the longest flight so far is 25 minutes, with a number of flights over 20 minutes.

My own Tomboy had a narrow escape whilst my son Byron was flying it in one of

the competitions. He had found a thermal and after 18 minutes of gliding the model was very high and he needed to try and lose height as it was becoming very difficult to see. He gave full up and rudder to try to spiral it down, which it started to do but was not losing much height. After quite a while Byron tried to stop the spiral and found that he had no control; the aircraft was drifting downwind and losing height. Byron and I started to walk in the direction in which it was spiralling. We must have walked around 1.5 km before we saw the Tomboy spiral into the ground in front of us. When we got to the aircraft we found that it was undamaged – the only thing that happened was the wing had moved under the elastic bands. I found that the LiPo had gone flat and that is why we had no control. I now have my name and mobile phone number in the aircraft.

Tomboy owners do not take them to the field every weekend but they do bring them to the monthly vintage events and have tremendous fun with them. It is strange to see guys that have very expensive and complex models having so much fun with a very simple aircraft.

I think that we have in some ways lost the ability to just have some fun and enjoy the hobby. The most rewarding part about the whole project is the fact that all of these Tomboys have been built at home and not mass-produced in a factory. My advice to clubs is to try something like this and to keep it cheap and simple. But above all keep it fun. **RCMW**

## Watch 3 DVDS online for FREE! Exclusive to RC Model World readers!

This month we're offering readers the opportunity to watch 3 modelling DVDs online for FREE. Watch 'Magic of soaring', '4th International Model Circus', and 'Scale Files' now by visiting <http://gb.trapletshop.com/modelling-2>. For each video, simply select which of the 3 titles you want to watch and enter the relevant promotional code below in the password box when prompted. You can find the '4th International Model Circus' and 'Scale Files' titles in the RC Scale Model Aircraft playlist. Following that, all you need to do is sit back, relax, and enjoy!

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### Magic of Soaring - Flat Field Thermal Soaring

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Watch online now with promotional code **1JEJGF1BGG**



### 4th International Model Circus

Held on the historic and attractive Aerodrome de Cerny near La Ferté Alais in France, this friendly and well-organised event just keeps getting bigger and better! In this DVD we have captured the heart of this fantastic event, so prepare your self for over an hour of superb flying from some of Europe's finest R/C aviators. Watch online now with promotional code **5GHI1A8FA7**



### Scale Files

Discover the secrets of aircraft scale modelling. This video includes a wealth of practical advice and guidance on how to research and recreate detailed scale effects. Watch online now with promotional code **18J3423AGH**



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# Diary Dates

A FREE service, advertise your club's event, show, fly-in, bring and fly, swapmeet, sale or whatever. Simply send in the details to: 'Diary Dates', RC Model World, Traplet Publications Ltd., Traplet House, Willow End Park, Blackmore Park Road, Malvern, WR13 6NN, UK. Or Email to [RCMW@traplet.co.uk](mailto:RCMW@traplet.co.uk) Traplet Publications Ltd. are unable to take responsibility for event cancellations. Check before you go.

## INDOOR

**24th Oct, 21st Nov '15, 23rd Jan, 20th Feb, 19th March '16**

**Indoor R/C Meets**, in the Main Hall at Fleming Park Leisure Centre, Passfield Avenue, Eastleigh, Hants SO50 9NL. From 7 pm to 10 pm. No free-flight models. £8 for flyers, £1 for spectators, proof of insurance required. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. (Tel. 01489 895157) or see our website: [www.wcaero.co.uk](http://www.wcaero.co.uk)

**27th Oct, 24th Nov, 29th Dec '15, 26th Jan, 23rd Feb, 29th March, 26th April, 31st May, 28th Jun '16**

**Indoor R/C Small Models Meets**, in the Main Hall at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. All meetings will run from 7.00 pm to 9.30 pm. Models to be flown at these meetings are to be limited to a maximum weight of 95 grams (3.5 ounces) for fixed wing aircraft, in flight trim, including battery (not to exceed a 2-cell LiPo pack). Helicopters are to be limited to a rotor diameter of 12" (305 mm). All models will be weighed before flight, and will be judged on their suitability for the venue on the evening. Admission to the meetings will be £4 for flyers and £1 for spectators. Flyers will be required to show proof of insurance. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. (Tel. 01489 895157) or see our website: [www.wcaero.co.uk](http://www.wcaero.co.uk)

**31st Oct, 28th Nov '15**

**Tonbridge Gassers and Rubber Fanciers Indoor Flying**, at King's Rochester Sports Centre, 601 Maidstone Road, Rochester, Kent ME1 3QJ. From 6.30 pm until 10.00 pm. Freeflight and also lightweight R/C timed flying sessions throughout the evening. For more information contact Steve on 0208 942 5000 or Eric on 01622 737814 before travelling to confirm

**2nd & 19th Nov, 7th & 21st Dec '15, 4th & 18th Jan, 1st & 15th Feb '16**

**Yeovil RC Flyers Indoor Flying** at Crewkerne Sports Centre (south west of Yeovil, Somerset), 7 pm to 9 pm, £10 per adult, juniors half price, insurance required. Flying takes place in a big, 4 court hall with some power points. Meets first and third Mondays each month, except Bank Holidays. For more details contact Jack Mitchell on 01935 445311 or Email [jack@home9999.plus.com](mailto:jack@home9999.plus.com) or check out the website [www.yeovilrcflyers.org.uk/index.php](http://www.yeovilrcflyers.org.uk/index.php)

**7th Nov, 5th Dec '15**

**Indoor Fun Flying at Furzeffeld 2015**. Furzeffeld 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](mailto:mp.quille@live.co.uk)

**7th Nov, 5th Dec '15, 9th Jan, 6th Feb, 5th March '16**

**Indoor R/C Meets**, in the Main Hall at Havant Leisure Centre, Civic Centre Road, Havant PO9 2AY. From 7 pm to 10 pm. No free-flight models. £7 for flyers, £1 for spectators, proof of insurance required. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. (Tel. 01489 895157) or see our website: [www.wcaero.co.uk](http://www.wcaero.co.uk)

**14th Nov, 12th Dec '15**  
**North London MFC Indoor Radio Control Meetings 2015**. Furzeffeld 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

**17th Oct '15**

**Night Flying Spectacular**, at Weston Park, near Shifnal in Shropshire (TF11 8LE). Top display pilots will be flying both helicopter and fixed wing aircraft with laser/strobe lighting and pyrotechnics attached, all flying to music. The supporting fireworks display will add to the entertainment. Daytime flying will start at 10 am, with general off the peg flying followed by two separate shows. The early show starts at 5.45 pm to cater for families with young children, followed by a late show, which starts at 7 pm. Hot food will be available from the on-site catering. After the show there will be a disco and bar in a heated marquee. On-site camping for Friday and Saturday will be on offer and includes the Saturday entertainment. A good trade line is also expected. For more information please contact Steve Bishop at: [stevenbishop@blueyonder.co.uk](mailto:stevenbishop@blueyonder.co.uk) or telephone: 01952 587298, 07758 895068. Alternatively visit the show website: [www.westonparkmodelairshow.co.uk](http://www.westonparkmodelairshow.co.uk)

**21st Oct '15**

**Phoenix MAC NW Area Autumn Swapmeet**, Deanwater Hotel, Woodford, Cheshire SK7 1RJ. (On A5012 Wilmslow to Poynton Road) Bar and seating in swapmeet room. Food available. Entry £2, tables £3. Doors open 7.30 pm. Table holders 7 pm. Contact Terry Mason, 07950 052039 or 0161 439 3816. Email: [pmaccheshire@aol.com](mailto:pmaccheshire@aol.com)

**25th Oct '15**

**LMA Gaydon**, Warwickshire (CV35 0BJ), further details from Paul Needham 07949 214282, Email: [mail@paulneedham.plus.com](mailto:mail@paulneedham.plus.com)

**1st Nov '15**

**Retford Model Flying Club Winter Swapmeet**. At the Babworth Road Sports & Social Club, Babworth Road, Retford, Nottinghamshire DN22 7NJ. Table set up from 9.30 am (small table £4 book in advance, £5 on the day. Large table £6 or £7 on the day) includes 1 helper. Doors open 10 am - 1 pm, Admission £3. Hot sandwiches, tea and coffee available from 10 am. For further information and bookings contact, Chris: 07966 764803, Gerald: 07941 867130. Website: [www.rmfc.org.uk](http://www.rmfc.org.uk)

**1st Nov '15**

**Wealden Flyers Swapmeet**, Ridgewood Village Hall, New Rd, Ridgewood, Uckfield, East Sussex, TN22 5TG. Table £6, traders from 8.30 am, doors open 9 am, entry £2. Contact Mark Tullett, 01825 765296 or [mark@thehobbybox.co.uk](mailto:mark@thehobbybox.co.uk)

**6th Dec '15**

**18th Annual Swapmeet**, hosted by Loughborough Model Flying Club, at Rawlins Academy, Loughborough Road, Quorn, Nr. Loughborough Leics. LE12 8DY (Directions on [www.lmfc.net](http://www.lmfc.net)). Sellers set up at 9 am, open to public 10 am. Hot & cold refreshments available, tables £4, admission £3, table pre-booking essential please. For further details call Richard on 07400 921929



*It's time to check over your indoor models for the 2015 autumn/winter season. For inspiration here's Jürgen's Schönle magnificent 1:5 scale Bf 109 G6 - all made from Depron!*



The North Cotswold MAC's Fly For Fun event comes to life on Sunday morning



# THE SPORT CHANNEL

Gray reports from North Cotswold MAC's summer 'Fly For Fun' event, which was quite possibly the best yet!

## This Month's Wise Words

Having reported on the North Cotswold MAC's summer 'Fly For Fun' event over its sixteen-year history I've lost count of the number of times that the prevailing weather in the week's lead-up to each show has given us cause for grave misgivings.

Some years our doubts have been all too readily justified and the magic weekends we've all looked forward to have been cruelly blown out and rained off. In 2014 we managed to get one precariously flyable day to celebrate our club's 65th anniversary before storms blasted the Cotswolds overnight.

We were beginning to have gloomy visions of a repeat performance as we prepared for the 15th and 16th of August this year. In the preceding week our working party put the finishing touches to our field at Far Heath Farm, Moreton-in-Marsh, in a steady downpour.

The club had already faced a few challenges since last year's show, following the retirement of long-serving Club Secretary, Ken Rathborne. Then a major technical setback when our trusty ride-on mower broke down irreparably, putting the

regular maintenance of our field, and our show, in doubt.

However, this year's flying season got off to a more auspicious start with new Secretary, Brian Lacey and wife Harriet providing some formidable organisational skills, plus the election of a new committee.

**"PS: AND THANKS FOR THE COMPANY.."**  
(EMAIL FROM GUEST FLYER)



The club's Secretarial Team of Brian and Harriet Lacey, who helped to make the show such a success



Entries for Saturday's David Boddington 'designer's event'



## THE SPORT CHANNEL

The team soon oversaw a major upturn on the club's fortunes, gaining three local sponsors and a brand new mower! Our summer event, now a popular fixture for modellers across the country, was assured. All we needed now was the weather...

### We Deserved A Break

Our doubts were unfounded though. As Saturday the 16th began we were met with a very light wind and the sun breaking through. On past form this was too good to be true and although we couldn't have guessed then, the weekend would prove to be one of our best ever.

As usual, due to the previous week's conditions, early arrivals were slow, but the flight line was hardly ever unoccupied. Our regular format of 'off the peg' flying and keeping something in the air all day works well and the mix of models in the pits becomes more eclectic each year.

Although we had little idea initially the weekend was to develop into one of the best we've ever held. As Saturday progressed it was plain to see that we'd struck lucky with the weather and the forecast was better still.

With our campsite already busy, visitors continued to arrive, some from as far afield as Merseyside, Essex and Cornwall, in the

first few hours. It was heartening to see our freshly mown strip (splendid work, Graham!) so active.

All our regular attractions were well supported again – the Bring & Buy section as ever turned up bargains and unexpected collectors' items.

The club's renowned barbecue chef, Gary Henshaw totally excelled himself and at one point was dealing with a queue that wouldn't look out of place at a festival.

Control line flying was much in evidence again, with smaller sport models using a mown circle and some genuine competition stunt models given their own slots on the main strip. Free-flyers had two days of perfect conditions in our adjoining field and attracted a lot of spectators over from the main strip. Local scale champ Dan Mellor managed to lose his newly finished Andrew Moorhouse 'Puffin' CO2 model in strong lift on a test flight but it was returned late in the day by two youngsters who found it a mile away in the village of Evenlode.

### Designer's Event

Following our 'designer's event' for Dereck Woodward models, this year we decided to feature David Boddington designs on Saturday and the Keil Kraft

'Junior 60' on Sunday. Both days brought out some fine specimens in all shapes, sizes, and both I/C and electric power. We now have to think of designers or themes for 2016's event. Any suggestions?

It was good to see some great British 'name' modellers attending our little gathering. Regular visitor Ian Peacock, local hero Sid King and Richard Preston, founder and designer of the 'Aerographics' kit and plans range, were all present on Sunday, much to the delight and surprise of fans in the audience!

As expressed in the line from our guest's email near our header, not only was our show a success on a model flying and entertainment level, the all round friendliness and good-natured ambiance of the weekend made it truly unforgettable. We've got to do it again. Fancy coming along?

Contributions, please to The Sport Channel, c/o the Traplet Publications address. All email correspondence to: gray\_rcmag@hotmail.com **RCMW**

## CONTACTS

**North Cotswold Model Aero Club**  
www.ncmac.co.uk



Winner of the Boddo event was Alf Andrews with his D.B. Sport & Scale Tiger Moth



Rob Simmonds built and flew this original 1990s Union Ducted Fighter at the field. Put it in a tree too!



Long serving NCMAC regular Shane Harding with Huckebein and Skyhawk EDF's



Dan Mellor and his exquisite CO2 Moorhouse 'Puffin', which hooked the best thermal of the weekend and headed off to the next village! Returned later to Dan's great delight



Trev Tennant from Coventry was one of the C/L contingent who flew on the main runway. A popular item with spectators once again



Gareth Evans made the trip from Bristol to fly C/L and F/F with us. Cute profile C/L Bristol Brownie flew with a genuine D.C. Bantam .049!



Giant KK Ladybird scale-up by Alf Andrews. Alf built and finished another two in tandem with this one, for customers!





Gary Henshaw's inimitable club barbecue successfully rounded off Saturday's proceedings



Chris and Marie Richards from Bridgnorth were among the free flighters who enjoyed two perfect flying days



Line-up of KK Junior 60s in various shapes and sizes in Sunday's designer's event. Eventual winner was Richard Curtis with his electrified standard version



Richard Preston of 'Aerographics' fame, who we last met nearly thirty years ago! He flew this very attractive, original (Boddo designed) KK 'Mini Super'



A very small sample of club committee member Graham Clayton's fleet, which we think stood at 96 models at the last count!



Furthest-travelled visitor was Tony Franklin from the Wirral. He has been flying for just a year with Apprentice and P-47 foamies but now has building projects underway



Terry McCafferty, a CLAPA Class 2 C/L stunt Champ, also flew slots on the main flight line to great acclaim



Simon Rogers' 'Flapalong' C/L ornithopter hybrid, seen in SC earlier, was sadly unsuccessful. It rolled itself up the lines to join Simon in the circle!



Richard Preston's electrified KK Chief thermalling happily above Far Heath Farm



The great Ian Peacock brought along historic DB 'Tyro Too' and 'Tyro GT' models that he designed and built for Boddo himself



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**TSK** Mystar .46 heli, untouched kit, classic all metal helicopter, purchased 1995, collectors model, requires engine, radio gear and rotor blades, offers. +35387 7949555 dermot.offlynn@yahoo.com Ireland.

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85 years old gentleman, selling up lots of stuff, engines, glow, diesel, transmitters, receivers, 2 Agastien Spitfires, 2 Cubs, 1 Tiger Moth, Irvine trainer, lots of spares, would like to sell as one lot. Futaba control. Call 01707 390479, Herts.

**TWO** Ripmax glow plug starters plus chargers, £8 each. Five model aero DVDs, £25. Ares Ethos quadcopter, £20. Electramax 400 electric motor, £5, all plus postage extra. 01603 759256, Norfolk.

**BRIAN** Taylor Spitfire Mk XIV and XIX plan (unused) plus Traplet laser cut wood pack (unopened), cancelled project, £75, collect or pay postage 01772 684244, Lancs.

**SELLING** up, SE5A, Cularis, Mirage, Futaba T10CP Tx, as new, flight box with starter, etc., electric motors, various props, many accessories. For free typed list, call Laurence 01372 373354, Surrey.

**E-FLITE** Super Cub, 68" span with servos installed, new condition, £140. Morse Scout, USA WWI electric biplane, 48" span, complete, just add receiver, £60. Call Peter 01970 832205, Ceredigion.

**FOR** sale all models and motors have to go, five transmitters and radio gear to go, 15 models, most not flown, radio all new, 2.4 g, giving up, 82 years old. 01767 314969, Beds.

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**SAIA** Marchetti SF260, 42" wingspan, traditional build from Jamara plan pack, fitted with retracts, has wing tanks, 300 watt brushless outrunner, ESC, finished in red/white spray finish, ready to fly, lovely looking model, bargain at £185, cost to build £268, offers considered. Call Colin 01553 630506, anytime, Norfolk.

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**WANTED** OS Wankel engine, would consider non runner. Peter 07754 669607, Essex.

**KONTRONIK** Rondo 400 speed controller wanted. Nick Fitton 02882 242810, 07899 963907, email: itwillpass@btinternet.com N. Ireland.

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# NEXT ISSUE

## Loaded Dice 30 EP



With nine UK Championships to his name, including four BMFA Nationals, four UK (GP) Championships and one UK Masters, Terry Westrop topped the competition aerobatic scene between 1986 and 1997. His famous Loaded Dice design was kitted and also made available as a magazine plan. So we were thrilled when Terry chose RC Model World to launch his new 30-size electric powered version. Loaded Dice 30 EP has obvious similarities to its F3A predecessors but the wing aerofoil was further developed for use with this model and to allow for some 3-D style flying. Together with the large flying surfaces, Terry reports that this worked out extremely well. Despite its small size this 'little looker' is precise, smooth and easy to fly.

## Supermarine Walrus



Franco Bugada reports on this impressive model of the Vickers Supermarine Walrus that was built by his Italian friend Ivano Busatto. This beautiful replica was flown at the seaplane meeting on June 21, on Sesto Calende, close to Varese. This event was arranged for the centennial celebrations of the SIAI Marchetti company, created in 1915 and now the property of Macchi - Alenia. The Walrus' scale is 1:5, giving a span of 2.80 metres and a total weight of 20 kg.

## DECEMBER 2015 ISSUE ON SALE THURSDAY 19TH NOVEMBER



## Roc Hobby P-39 Racing Airacobra

As far as assembly goes there is not a lot you can say about this sporty looking kit, as the EPO airframe is virtually finished out of the box. First impressions by our ace kit reviewer, Josh Spiers, were of a super smooth yellow painted finish over an airframe that sports scale panel lines, scale exhaust stacks and a plethora of racing decals. Grab a copy of next month's RCMW to see what he thought when he launched it into the air!

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