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74 NATIONAL MUSEUM OF THE USAF

In the first of a two part feature, Bill and Micki Bowne tour a large museum built to display aeroplanes operated by the United States Air Force. There's plenty of inspiration for your next scale model in Micki's photographs!



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Pre-flight

Welcome to the July issue of RC Model World. In this issue we are on the third pass of our recently introduced 'Pick Your Own Plan' offer, which you will find in the centre of the magazine in lieu of a pull-out plan, which will now appear bi-monthly. The first and second 'Pick Your Own Plan' offers were positively received judging by the plans that were ordered using the code printed in the March and May issues of RCMW. And I hope that you will find an aeroplane that you want to build from the four plans that we have selected this time around.

The response to Traplet management's bold move in halving the frequency of the pull-out plans was quite muted and from those readers that did send messages they fell roughly 50/50 into the for and against camps. Garnering some feedback from those who enjoy collecting magazine plans was to be expected but I was quite surprised to see an equal number of messages from readers who took the time to write in with their views on not requiring a pull-out plan in every issue.

Anyway, my own personal fears have been quashed somewhat as it would appear that not all readers intend to 'run for the hills' whenever we don't publish a pull-out plan. Hopefully the mix of articles that we supply each month is strong enough to encourage you to buy a copy of RC Model World, regardless of the type of feature that occupies our centre spread. Which brings me neatly on to the content of the magazine this month...

Chris Williams kicks things off with the conclusion of his Super Javelot plan feature. I'm sure the flying pictures of this good looking scale glider will inspire you to clear your building board ready for when the laser cut wood pack becomes available, details of which are supplied at the end of Chris' article. Chris also provides additional coverage of scale gliders in his Scale Soaring column, in which he visits the first Middle Wallop aerotow event of 2017.

We have quite a few kit reviews for you to enjoy this month, namely the E-flite Opterra 2M flying wing that sports three different camera carrying options. We also flight test FMS' latest WW2 warbird in the form of a rather neat little 1100 mm wingspan Hawker Typhoon, complete with split flaps and electric retracts! Scale heli enthusiasts are not forgotten as Martin Briggs puts together a Roban scale body for the Bell 212. And we top everything off by revisiting the Capiche 52 from Weston UK and seeing how it performs when flown by a top freestyle pilot.

Our reports this month both come from the USA, starting with coverage of Florida Jets before taking a look inside the National Museum of the USAF, which is full of great subjects for R/C scale models.

Add in a sprinkling of regular columns – High Tension (petrol engines), Depron Diary (building with foam) and Brit In Brittany (adventures of an ex-pat) – and it should add up to a great read, I hope you will agree. So until next time...

Happy flying!

Kevin

Kevin



Kevin Crozier

Editor | Radio Control Model World

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Enter Your Classified Ads On-line

The free classified adverts in the back of Traplet magazines are a great way for readers to sell on any unwanted models, engines and radios, or related R/C equipment. However, our free Classified Advert form will shortly be moving on-line, where it will be available at the following link:

<http://thehobbyhub.com/classifieds/place-ad/>

In this way it is hoped to encourage more free classified adverts to be placed as it is much simpler to type out the details, rather than cutting out and filling in the form presented at the back of the magazine. It will also save those regular readers who collect every issue from defacing their magazines, and mistakes should be a thing of the past as the published

advert will be exactly as you have typed it in rather than relying on our staff to decipher the sometimes difficult to read handwriting.

Besides making it easier for our readers the on-line form will also be a great help to our staff as each form needs to be scanned and then each word has to be typed in manually, which is very time consuming.

Every free classified advert entered online will appear in a new classified section on The Hobby Hub (thehobbyhub.com) and each month our magazine designers will take this information and put it directly into the magazine.

If you do not have access to the Hobby Hub website, or if you simply don't like using a computer, then please ask a family member or friend to fill it out for you as the printed form (or copies) will not be able to be processed after the September issue.

Howzat! Mystery Glider Solved



We recently received the following letter from Martin Howitt, who was trying to identify an aerobatic slope soarer that had come into his possession:

"Hi Kevin

I acquired the slope soarer (see picture) two years ago but I do not have its name or type. And unfortunately Peter Rennie, who sold it to me, has since passed away. Peter also gave me a lot of plans, none of which resemble the slope soarer and which is similar to an Omega. But the wingspan is 2.2 metres and the Omega seems much less than this.

So I'm wondering if you could assist in its identification and from what plan?"

With my imaginary deerstalker on and my well-thumbed copy of the RCMW Plans & Construction Guide (still available: gb.trapletshop.com/plans-and-construction-special-rc-model-world/), I began my search in the Sports Glider section. It didn't take too long to identify a likely candidate, the Howzat (MW2051). And I was pleased to see that the designer was

none other than Chris Williams, our scale gliding correspondent and the man behind many of Traplet's large scale glider plans, including the Super Javelot described in this issue.

A quick enquiry to Chris confirmed my suspicions, on top of which he kindly agreed to re-design the Howzat with all-mod-cons to bring it fully up to date, with a modern R/C installation and designed for a laser cut wood pack.

Less than two short months later I received a note from Chris saying, "Howzat II has been built and flown. I'm just waiting for a really decent slope day to properly sort her out..."

The model has since been fully tested (see the other picture) and Chris has completed a plan feature for it, which we will publish shortly.

So our thanks go to Martin for providing the inspiration for this project and to Chris for pulling out all the stops to get Howzat II drawn up and into the air in such a short space of time.

Front Seat Driver

Peter Maw's review of the Galaxy Models Chipmunk has proved to be popular, despite not pulling any punches about some aspects of building from a traditional veneered foam wing/balsa fuselage kit.

Among the emails we received was this one from Alun Thomas, who hails from Cornwall, we believe:

"Dear Kevin

Many thanks for the review of the Chipmunk; it's an outstanding model and quite special to me as I flew the 'Chipfrog' quite a bit in days of yore.

One thing I do remember, though, is that the aeroplane may not be flown solo from the rear seat as the C of G would be out of limits. If you want to show it in a scale fashion the pilot should be in the front seat!"

Many thanks for the reminder about the Chipmunk's solo piloting position, Alun.

Peter has kindly returned the review model to Traplet Publications so that it can be statically displayed on our stand at model shows

throughout the 2017 season, so the poor pilot will have to stay put for now (but at least he can reach the rear magneto switches...!).

Strangely, information about flying the Chipmunk solo seems quite hard to come by, at least if a rudimentary Google search is anything to go by. But eventually I came across an entry about the Shuttleworth Collection's aircraft, a

T.22 in all-yellow RCAF livery. Besides a picture clearly showing the aircraft being flown solo from the front seat this web-page also has a link to a rather good video of the aeroplane in flight at one of the Old Warden air displays whilst being flown solo:

www.shuttleworth.org/collection/chipmunk/



F3A Champs At Buckminster



The Great Britain Radio Control Aerobatic Association (GBRCAA) will be holding its annual association championships on Saturday 5th August and Sunday 6th August, 2017 at the BMFA National Centre, Buckminster, Lincolnshire.

This is a fantastic opportunity to come and fly with the GBRCAA and learn from the experts. It will improve your flying of aerobatics and you can

participate in some friendly competition.

The Clubman schedule is a great place to start and it can be flown by any model capable of basic aerobatics such as a Wot 4 or similar, so long as it is under 7 kg. Clubman pilots are only required to hold a BMFA 'A' certificate and first time entrants do not need to be members of the Association. (For more details and a diagram of the required manoeuvres please see the



'Clubman Aerobatics' article published in the May 2017 issue of RC Model World, starting on page 84 - KC.)

The GBRCAA will have some great prizes on offer for Clubman pilots, from BondAero and OptiPOWER, including an Axiome 70 Biplane designed by F3A World Champion Christophe Paysant Le Roux – see picture.

Further information can be found in the Competition News section of the GBRCAA forum at:

www.gbrcaa.org/smf/

Manx Tip #1

Michael White, who lives in the Isle of Man and who has designed many plan features for this magazine, has written in with a tip that may be of interest to readers who use petrol engines with Walbro type carburettors:

"Dear Kevin

I have heard of several cases where after a prolonged period of disuse/lay-up this type of carburettor can suffer from internal filter screen blockage due to oil residue hardening on the filter screens. This is indicated by the carb refusing to be choked. Very often this entails a strip down of the carburettor to replace the screens etc. which can cost quite a few bob and one needs to know how to do the job properly. For the third time now this has happened to me when I didn't have a spare carb servicing kit.

I now fit my fill line into the inlet connection on the carb and the other end into my fuel can and I pump until fuel comes out of the carb air inlet venturi. This has the effect of pressure washing the screens and softening the hardened oil residue. Turn over the prop several times to distribute fuel around the engine and repeat the procedure once more.

With the model well secured, try a start with the throttle fully open. You may have to have a couple of starts but you may find that eventually the engine runs correctly. Mine does!"

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www.4-max.co.uk

HACKER SKG BERGFALKE



This 2000 mm wingspan, semi-scale glider is part of a series of SKG (Simple Known Glider) models from Hacker. Strong, lightweight and durable, the excellent flight characteristics of these foam soarers guarantees great resistance in case of any accidents. This attractive model can be flown from the slope or it can be fitted with a tow release for aerotowing and be towed with the Hacker Master Stick. Items needed to complete are an R/C set with at least four channels, 4-5 micro servos (9 g), a receiver, battery, basic tools and thin CA, with CA kicker.

www.zoomport.eu

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Innovative Products of America have introduced the 8 in Premium, Industrial Diamond-File Set (#8108). Diamond files cut ten times faster, smoother and cleaner for a better finish than conventional files. They can cut into welds and hardened surfaces that other files can't. The files have a 12 inch overall length with an 8 inch blade and come in a custom folding pouch. The Diamond File Set contains four files – Half Round, Flat, Square and Round – with an abrasive diamond coating that is harder than traditional files and usable in any direction.

www.ipatools.com

PILOT-RC EXTRA 330LX & EDGE 540V3



We've received information on a couple of new releases from Pilot-RC. The 35% 107 Extra-330LX designed for 3D aerobatics/competition features a much thinner wing and stabiliser aerofoil than the standard Pilot-RC Extra-330. It is available in two colour schemes: Red or Blue. Also new from Pilot-RC are three new eye-catching, pre-painted on Oracover, colour schemes for the Edge-540V3. The schemes are available for the 67 inch, 78 inch and 92 inch wingspan versions of the model.

www.macgregor.co.uk

CHEERIE ELECTRIC



The Cheerie is a lovely little four channel electric powered sports aerobatic model. It's ideal as something to quickly put in the car for one of those impromptu evening flying sessions. Building it is a pleasure in itself if you like a bit of balsa bashing. The full size plan, a set of comprehensive instructions and accurately CNC cut parts take the drudgery out of building off a plan. Construction is simple and easy to follow. Very similar to its big brother, the Wallaby Mk2.

www.phoenixmp.com

DYNAM MARTIN B-26 MARAUDER



Dynam's 1500 mm wingspan B-26 Marauder brings the familiar scale outline of this iconic aircraft to the skies again! Their most ambitious warbird to date introduces redesigned tricycle retracts for improved reliability and all new counter rotating propellers for scale appearance. Power is provided by two Tomcat 3512-650KV brushless motors for satisfying sport scale performance. Providing capable handling on short grass runways, in addition to the redesigned retracts the B-26 also features steel wire struts, and wide and soft scale sized tyres. To maximise convenient assembly and transport the B-26's outer wings can be detached from the engine nacelles, or the entire wing can be removed as one single piece. Major assembly of the aircraft is completed with only ten screws! For a large aircraft the B-26 can be made very portable to fit in your car's boot in under three minutes.

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Opterra 2M

Kevin Crozier pilots E-flite's two metre span flying wing and finds out how it performs as a platform for aerial photography



Below: Pusher flying wings are favoured by FPV pilots and for commercial aerial photography due to the unobstructed view from the nose



The outer box and inner tray can be retained to use as a carry case

Taking photographs and video from a model aircraft is nothing new but in recent years aerial photography enthusiasts have been increasingly drawn to using drones as their preferred platform for carrying cameras aloft, such has been the pace of development in this sphere of R/C aircraft.

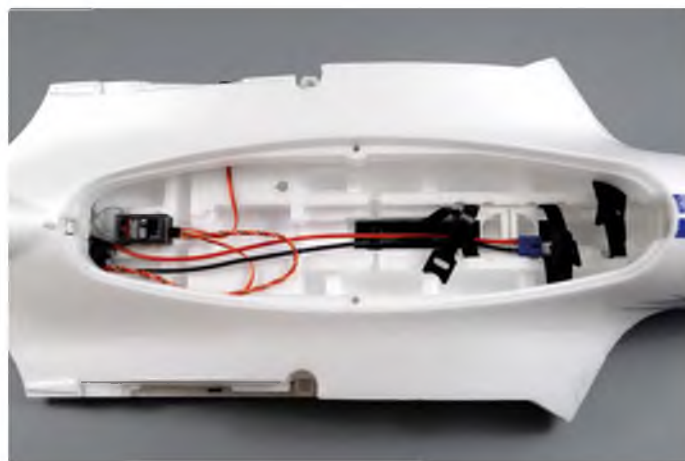
However, there are still a good number of traditional fixed wing pilots who still enjoy taking pictures from the air, plus there is starting to be a flow of new pilots coming into the fixed wing side of the hobby from flying multi-rotors, especially those with an interest in First Person View (FPV) flying. The pusher powered flying wing has become a firm favourite with FPV enthusiasts as it enables a bird's-eye view from a camera mounted in the extreme nose of the model without any obstructions caused by other parts of the airframe or the flickering of their displays caused by shooting through a propeller.

Those canny designers at Horizon Hobby have recognised the wide ranging appeal of such a flying wing and, hence, have developed the Opterra 2M to appeal to both FPV pilots, aerial photographers and videographers, as well as traditional electric powered gliding enthusiasts. I also expect that you will find quite a few Opterra's exploring slope lift too!





After assembly of just a few parts Opterra is ready to fly straight from the box



There's plenty of room for different size 3S LiPos in the cavernous fuselage. I may even try fitting a standard Rx in there for a spot of thermal soaring!



The folding prop keeps everything streamlined whilst in the glide



Close-up on the finger pockets for launching and the C of G dimples



The standard nose (and the model!) is supplied with plenty of glued-in nose-weights

Pictures 3 Ways

At the risk of sounding like something off the menu from MasterChef, the Opterra offers three different camera mounting points, two at the nose and one in the middle of the aircraft pointing directly down. The model is supplied with multiple clip-on nose sections, including a rounded black painted one for flying the Opterra as a conventional model. As well as the clips, the nose sections are held on with two small screws and so it can be quickly changed for a camera nose.

A wide range of cameras can be fitted, notably GoPro Hero 3, Hero 4 or similar action cameras using one of the differently shaped moulded foam inserts to hold the camera securely in place. If fitting an FPV camera you will find plenty of space at the back of the generously sized battery tray onto which you can attach a video transmitter (VTX) using hook and loop tape.

A further flat camera station is moulded into the top of the fuselage, just behind the nose, where a small camera can be mounted, such as a Mobius.

Finally, there is also a downward looking camera bay in the belly, which is shaped to accommodate a GoPro or similar style action camera

BNF Or PNP?

The Opterra is available as either a Bind-N-Fly model, complete with a ready fitted Spektrum AR636 AS3X receiver that features SAFE Select technology. Alternatively, you can buy the PNP version, without a receiver, which will be appreciated by those customers who do not use a Spektrum R/C system.

Our review sample was of the BNF type, complete with Horizon's well proven AS3X three-axis stabilisation system that is integrated into the receiver and which helps smooth out the effects of any wind gusts and turbulence. The Rx also features optional

SAFE Select Technology, which can be turned on and off using a Tx switch. SAFE stands for Sensor Assisted Flight Envelope.

We have come across SAFE systems before in previous Horizon Hobby models, where they are primarily used as panic recovery systems that put the aircraft into a straight and level attitude following a momentary loss of concentration or orientation by the pilot.

In the Opterra the SAFE Select technology operates a little bit differently, as it does away with the Panic button but still offers the other benefits of a SAFE system. When activated you get:

Pitch and Bank Angle Limits – These keep the aircraft from rolling or pitching to extreme angles and they also prevent excessive climb or dive angles during the launch and landing phases.

Automatic Self Levelling – This instantly returns the wings to level when the sticks are released. During launch, if SAFE Select is turned on it will keep the wings level and the model climbing until you get both hands back on the controls. If you are flying FPV with a headset then activating SAFE Select is claimed to allow you to enjoy the view without having to constantly worry about trying to stay level or, in extreme circumstances, getting disoriented and losing control.

Advanced Aerodynamics

Vortex generators near the leading edge on top of the wing and just ahead of the elevons on the bottom of the wing are said to improve both slow speed stability and control. The Opterra's airframe is constructed of carbon reinforced Z-Foam, which keeps weight to a minimum whilst maintaining strength and rigidity. But since it's a relatively large

model it still feels pretty meaty in the hands, especially when loaded up with nose weight, a 3S LiPo and a camera.

The airframe is very easy to assemble and transport. It features plug-in wing panels with swept up winglets and short, in-board vertical fins. The wings are secured with quick release locking pins so assembly or disassembly takes only a couple of minutes. Despite its impressive size the Opterra packs away inside its box, which has been designed to be retained as a carrying case. The model is powered by a brushless 1300 KV outrunner coupled to a 40 A ESC. An EC3 connector links this to a 2200-3200 mAh 3S LiPo, for which there is plenty of room inside the cavernous fuselage. The power system provides ample thrust for carrying the recommended cameras or performing simple aerobatics, whilst the folding prop minimises drag whilst gliding.

The elevons are operated by 13 g digital metal geared servos, which, like the other avionics, are factory fitted and they are well set up at neutral.

Assembly

Well, this is going to be a short section of the review as the Opterra is fully built straight from the box! It simply needs all the component parts slotting together and within a couple of minutes, plus some set up/checking time, it is ready to fly.

First the swept up winglets are fitted to the end of each wing. They slot easily into place, where they are retained by a 90 degree turn plastic locking pin. The vertical fins drop into slots located at the rear of each plastic wing root moulding, where they are secured by the carbon fibre wing tube as it passes through the fins and into each wing panel. A thinner, shorter carbon rod acts as a front joiner.

The wing tubes are slid into place across the fuselage first, then one wing panel



Several different shaped inserts are supplied with the camera nose. The one front and centre is for GoPro style cameras



A set of weights are provided for maintaining the C of G when swapping between different cameras

assembly is pushed onto the tubes before repeating for the other side. Each wing panel is secured using a larger version of the locking pins used to fix the winglets in place. These are easy to misplace so it would have been nice to have been supplied with a spare locking pin of each type; a spare set would probably be a wise investment.

We decided to test fly our model with the non-camera rounded nose, as supplied ready fitted to the Opterra. This comes complete with nose weight glued in place and if you use a 3S-2200 LiPo all the way forward on the battery tray then the glider should balance correctly. If not then several rectangular nose weight pieces are supplied that can be added behind the nose.

The underside of the fuselage is moulded with two, long finger pockets, which ensure a good grip of the unusually shaped model whilst hand launching. Just in front of these are two moulded dimples that define the correct balance point. It's a bit of an art hoisting the model up above your head using the finger grips, then gingerly moving your thumbs forward until they sit over the C of G dimples. If you are lucky the model will balance first time but if not you tend to end up wearing the Opterra like a hat... On me 'ead, son!

Of course, those lucky enough to own a balancing rig will not have to worry about such indignities!

Setting Up And Control Tests

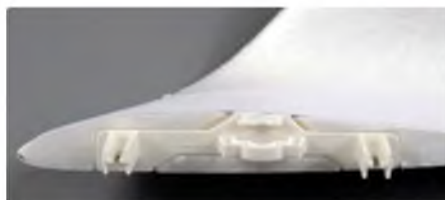
As usual with Horizon products the excellent manual gives clear information on checking the control directions when the AS3X system is active. Unlike some models, where the amount of movement is relatively small and tricky to see clearly, the elevons on the Opterra waggle about quite a lot when the model is moved by hand so it is easy to confirm that they are responding correctly.

The manual also provides Quick Start and Computerised Transmitter Setup tables, so setting it up on a DX6 transmitter was very quick and easy. The servos proved to be well centred but the manual also calls for a tiny bit of reflex to be added in the form of 1 mm up on each elevon. Since the wing mounted servos are shrouded with well glued plastic mouldings it is easiest to make any adjustments to the pushrods at the control horn by rotating the clevises as necessary.

The set up table in the instructions calls for an eight minute count down timer to time your flights, which is re-started every time



Large locking pins are used to secure the wing panels. Smaller ones are used to fix the winglets



Close-up of a winglet fixing, with the locking pin mechanism in the centre



The pins drop into slots and are turned 90 degrees to lock them in place – quick and easy!



Top view of the port wing showing the winglet and locking pin in place. Note also the top mounted elevon servo shroud and the vortex generators along the leading edge

you push the throttle stick above 25%. This way gliding phases, when little power is being taken by the flight battery, are ignored by the timer so you can achieve long flight times with careful throttle management.

I haven't pushed this to the limit yet, but if I was to take a bit too much out of a LiPo then a Low Voltage Cut-off would kick in and the motor would pulse to let me know that it was high time to land.



Short vertical fins locate in slots moulded into each wing root



Each servo extension lead plugs into a connector that is firmly fixed within each wing root

Over The Long Grass

With any new hand launch model it makes sense to ask an experienced 'lobber' to throw it for you so that you can concentrate on flying the model and making any initial corrections that may be required – even when test flying one equipped with the high levels of launch assistance that SAFE Select provides!

Strangely, my usual choices of launch buddies found that they were otherwise engaged when asked to give the Opterra a bung! Could it be that the thought of having a high revving pusher prop whizzing just past their ears was proving just a tad off putting...?

Fortunately, our local flying patch was covered in a thick layer of long grass so we decided to try a solo hand launch with the power off to get an idea of the initial set up and to allow my son, James to take some launch pictures. With some pictures 'in the can' and a good idea of the trim of the model, James could then take over and launch the model for real, after which I would throttle up and continue with the first flight proper.

For those of a nervous disposition concerning pusher props this process worked well and is highly recommended. Within just a couple of test glides I had established that our Opterra needed a fair bit more up trim than the 1 mm specified in the manual, so I wound in some more up trim on each side using the clevises. The next test glide saw the Opterra reach a respectable distance after leaving my hand, so James put his camera down and collected the model. He then hoisted it aloft and prepared to launch, with an instruction from me to shout 'CLEAR' when it was safely clear of his hand. All went well and after a slight dip as it settled into a glide, power was applied and the Opterra climbed smoothly away.

This first flight revealed the need for even more up trim and there is a specified way in the manual to do this. After dialling in the required trim you have to leave the controls alone for three seconds in order for the receiver to 'learn' the correct settings and to optimise AS3X performance. It sounds like black magic to me but it works well in practice and the Opterra was soon gliding around hands off while having ample control authority in both SAFE Select and AS3X flight modes.

After bringing the Opterra around for a few low passes so that James could take some flying pictures, I landed the model, easing her down into the long grass for a gentle touchdown – lovely! A second flight soon followed and this time I wanted to try out a spot of thermal soaring but I was unable to detect much in the way of lift despite promising signs from circling birds.



Although designed for GoPro cameras the belly mount proved to be an ideal fit for a GitPro camera too!



Opterra can be assembled in just a couple of minutes

James, an FPV drone enthusiast, worked it out straight away – as this model is designed for camera work and FPV, the AS3X system irons out the Opterra's flight path to keep everything on the straight and level. Hence it was motoring straight through any patches of lift and suppressing the 'rising wing' that I usually rely on as a sure sign of a thermal.

Since stabilisation is active in both SAFE Select and AS3X modes you could forego the use of the AR636A receiver if you enjoy

thermal soaring and fit a non-AS3X receiver so that you can sniff out any lift that those long wings are sure to find – or buy the PNP version! There's plenty of spare space inside that big fuselage so I plan to piggy back a normal receiver so that I can swap between stabilised and non-stabilised flying at will. There are just three wires to connect up so it will only be a few moments work to change the model's flying style if there are some big 'boomers' about!



KG gets ready for a test glide over the long grass



The instructions recommend a slightly nose high launch



Steep turns with the belly mounted camera will help include the horizon in your shots



Black underside stripes help orientate the model when flying at higher altitudes



Belly cam view. The foam surround causes vignetting, which resembles the view from a porthole!



Vertical view of the local model club field

This is not to say that the Opterra will not thermal using AS3X if you use an alternative means to discern any lift – maybe following some circling birds or other gliders, or even fitting a vario? It's just that the enjoyment of finding your own thermal activity is sure to be heightened when using a non-stabilised Rx.

Flight, Camera, Action!

Borrowing from the title of our sister drone magazine, after the successful trimming flights it was time to fit a camera and see how the Opterra performed as a platform for aerial photography. I used a GitPro camera, which is of similar style to a GoPro and I was pleasantly surprised to see that it fitted in the moulded foam bays perfectly. This bodes well for all those GoPro clones out there.

In the first instance I installed the camera in the mid-fuselage position, with its lens pointing directly down from the model and set to record pictures every five seconds. This was a fairly normal flight, apart from maybe a higher than normal level of steeply banked turns in order to try to get the camera to point at the horizon, rather than taking all pictures vertically downwards. The results were very promising, even allowing for the extreme fish-eye effect of the picture files straight from the camera. However, a bit of post-processing using Photoshop or a similar picture editing package would soon eliminate most of that distortion, if required – I quite like it though!

One thing that was apparent was that as the camera has to shoot through the belly of the Opterra the pictures exhibit quite prominent white vignetting around the edges. Again this can largely be taken out in post-processing, should you wish.

For the next outing I fitted the GitPro in the appropriate nose insert and was again pleased with how well it was secured. However, the camera nose was considerably lighter than the standard nose, so I attempted to use some of the nose-weights supplied to make up the difference. Calculating the amount required showed that more pieces would be required than there was space for in the small gap between the back of the camera and the front of the model. I made up the difference using folded strips of lead flashing, which is more dense than the supplied weights, so I could make the nose

weight up as a small, thin package. This was bound with electrician's tape and secured to the top camera mount with Velcro. Another strip of tape went over the thin block of weight for added security. Finally, a check at the dimpled balance points showed that the Opterra was set up as before.

Initial trials with the camera nose have shown that the unobstructed view from this position has a great deal of potential, both for aerial photography and film work too. Somewhere nearby is a photograph taken from the nose mounted camera to give you an idea of what's possible using this versatile camera carrying model. The forward view using an FPV camera should be just as clear and I'm looking forward to borrowing a camera and goggles from James to try it out!

In Summary

With no building required, super fast assembly, numerous camera mounting options and excellent in-flight stability whilst filming, what's not to like if you are an aerial photo enthusiast?

As a standalone electric powered glider the Opterra is great fun too and it loops nicely if ever you find yourself a bit bored with floating around. It will even roll, albeit a bit slowly at the recommended control throws. **RCMW**



With power on the Opterra is no slouch



The nose mounted camera gives a clear, unobstructed view with only slight vignetting this time caused by the edges of the foam mount



Smooth landings are the order of the day thanks to the stabilisation offered by the AS3X equipped receiver

THE MODEL WORLD

MODEL INFORMATION

NAME:	Opterra 2m
MANUFACTURER:	E-flite
DISTRIBUTOR:	Horizon Hobby
WEBSITE:	www.horizonhobby.co.uk (search 094EFL11150)
PRICE:	£210.00
MODEL TYPE:	Electric Glider
CONSTRUCTION:	Moulded Z-Foam
PARTS SUPPLIED:	Airframe, two 13 g servos, Spektrum AR636A receiver, 1300 KV brushless motor, 40 A ESC, folding pusher propeller
PARTS REQUIRED:	3S 2200-3200 mAh LiPo, DSMX transmitter

R/C FUNCTIONS

- 1:** Throttle
- 2:** Elevons
- 3:** Elevons

MODEL SPECIFICATIONS

WINGSPAN:	78.3 in (1989 mm)
LENGTH:	40.8 in (1036 mm)
WING AREA:	1033 sq in (66.6 sq dm)
FLYING WEIGHT:	67 oz (1899 g)

Dislikes

A spare set of wing and winglet locking pins would be appreciated • Hand launching under power is recommended but powering up after launch is safer

LIKES

Fast assembly • Provides a stable platform for aerial photography • Choice of three camera positions • Deep finger pockets for hand launching • Climb out is stabilised, which is appreciated when solo hand launching • Easy to fly

High Tension

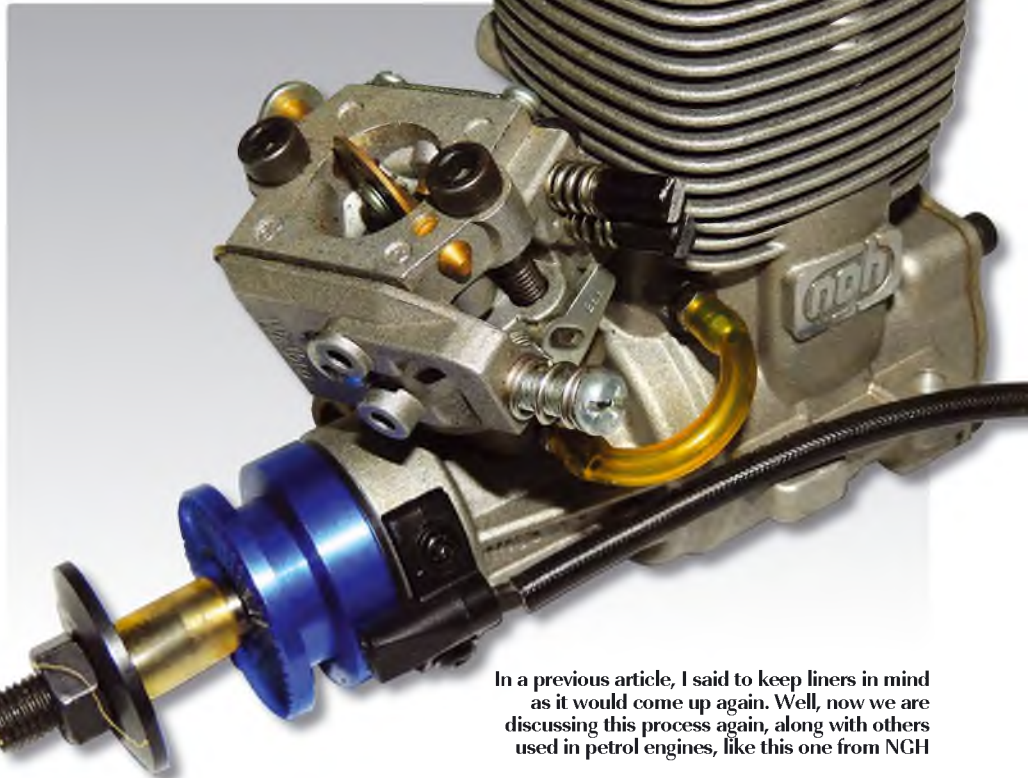
Ivan V discusses the best material to use for a model engine liner, plus modern coatings and how to achieve the best finish

Don't think many model engineers manufacture their own engines these days, which is really a shame. The simple fact is that all the development work has been done over thousands of hours in past years by so many modellers and model engine manufacturers, so we don't have to strain the brain with development ideas and calculating all the probabilities or possibilities. With all the design factors worked out it is a simple matter of using an established engine as a source of information.

We don't have to complicate the issue as we would be manufacturing a one off engine for our own use, so there are no concerns as to cost of manufacture and profit margin of sales, no warranty to worry about and each part of the engine would be totally unique and suitable for its single purpose as production of multiple engines is not a consideration.

You don't have to produce another O.S., Saito or DLE for example – your engine is just for you and is not going to be compared on the market with established commercial engines. All the concern about finish, heat treatments, exotic metals are not the concern of a home manufacturer; the end requirement is an engine that runs well and which is your own creation.

Previously, we have been discussing the different liners and liner finishes in part and here is an example that is of concern to some would be engine builders – what to use for the liner and how to achieve the finish?



In a previous article, I said to keep liners in mind as it would come up again. Well, now we are discussing this process again, along with others used in petrol engines, like this one from NGH

I want you to consider now the average life of a model engine that is run correctly and cared for in a reasonable manner. Really, do we keep them so long until they are worn out

and then consider rebuilding or replacing? Well, not really in my opinion as the simple fact is that our model engines rarely wear out.



Nickasil was developed in 1960 by the Mahle company in Germany. In full size engines a NiSC coating on cylinder liners or engine block bores outlasts a cast iron bore by a factor of 10



This is quite distinctively a brass cylinder liner (hard machining brass grade) with a hard chrome inner surface. The outside surface is masked off during the process in order that the chrome is only applied to the inner surface



The colours on the rim of this liner indicate use of one of the evaporative coatings, such as evaporated nickel or a bi-metal coating, either of which are super slick and extremely hard

Simply Steel

If, for example talking about the liner, I suggested that ordinary mild steel would be quite adequate, would that raise a few eyebrows? Okay, let's consider how many hours you might put on the 'clock' of your super blaster petrol (or any other type) engine.

Let's consider you fly on Sundays and you average three flights of about 12 minutes duration. Now here I am in a bit of a grey area as I don't know your weather patterns so I will consider ours (where I live) where, on average, we have 40 Sundays per year that are suitable for flying. The 12 days that are not suitable are when it's raining, too damn hot or too damn cold, or too windy. So, 40 days it is.

On each of those days our three flights log up 36 minutes of engine time. Multiply the 36 by 40 and the clock is showing 1,440 minutes, which is 24 hours – your engine is now nicely run in. If you used that same engine for five years it would log up only 120 hours, which is nothing as far as wear if tuning and lubrication is correctly used.

I would hazard a guess that an engine with a mild steel liner (not free cutting steel, but good mild steel) and a cast iron ring would more than likely last the distance. The variables are, obviously, modellers who fly in excess of that time, constant needle fiddlers, low grade lubrication, incorrect cowling (overheating the engine), flying in dusty conditions and a host of other problems that can crop up. So, for those reasons manufacturers produce engines with a range of liners that will take quite a bit of abuse, yet still last. And those same liners, given correct care, will last way beyond the time we keep or use the engine.

Simply said, modern engine liners are almost bullet proof and wearing them out is not a feature or even a reasonable consideration. Okay, let's see what makes them so good.

So Many Processes

Having dealt with steel, hardened steel and cast iron liners – all good – I am now going to delve into the wide world of coated liners and linings. Why liners and linings, you ask? Well, fact is, insert liners are almost a thing of the past as the protective (wear tolerant) liners are now, mostly, all a lining of the inside of the cylinder.

While we look into this lining business (and liners as well), I will dispense with a myth or misnomer that has been doing the rounds for quite a few years. It is one of those references that has no known instigator but being in reasonably common use it becomes the byword.

This is along the lines of closed loop and push/pull cable control of models. What in hell is a closed loop? If it is not closed it is a 'C' as a loop is a full (closed) circle. As for a 'push/pull' cable control, how in hell do you 'push' a cable?

There's an old saying here as a reference as to how difficult a job will be that tells about a pound of butter, a hot knife and a wild cat's backside – but I won't repeat it as it is a bit unsavoury! However, I will mention the contradiction of terms that caused me to mount my soapbox and this is in reference to ABC engines, which, according to many 'pit experts', refers to an engine that does not have a piston ring. Well... that is a load of old cobbles, which we will see as I progress with the next discussion.

What Does It All Mean?

Some years back (well, quite a few years back!) I was supplied with the information that Jaures Garafoli produced an engine with a brass liner that had a hard chrome plating. You might well ask, who he was and was he the inventor? Well, he was the designer and producer of Super Tigre engines for many years, until his retirement, when the industry (manufacturing rights etc.) went to a Chinese company.

Jaures was a great innovator in the model engine business and many of his engines became (and still are to some) legendary. In the quest for power and rpm he experimented with various liners to produce



One of the most well known and respected liners is used in many O.S. engines. Hardness treated steel of super accurate roundness, they have a reputation for never wearing out (under conditions of reasonable use)



An example of a large capacity petrol engine cylinder with an integral chrome liner. Hard chrome is applied directly onto the inner surface of the cast aluminium alloy cylinder – a very popular surface coating

a unit that was heat stable under use and extremely low on the drag factor (friction coefficient), which is a desirable feature when high rpm is the end result.

Now, I don't know if he was the first to use the idea, but it is claimed that he was by knowledgeable authorities, and nobody of great note has disputed it. So... Jaures developed the first ABC configuration – a hard brass liner with an internal coating of hard chrome. This was not without various problems in the development, as a suitable brass had to be found to match, as closely as possible, the expansion of the aluminium alloy cylinder.

Next was the hard chroming, a process that needed a degree of precision in order that an even thickness coating was applied. And it had to be hard chrome, not decorative chrome.

Then came the final finish, when the liners were honed to the final precise finish and suitable hone marks (in a figure of 8 pattern) were inscribed on the surface for the retention of lubrication. Common honing processes could not cut the chrome so diamond hones had to be used. The next step was to produce a hard aluminium alloy piston to work in the chrome liner and this was not a simple weekend job.

When the first engines were produced they were in the winner's circle and the process was established. Soon, many manufacturers were producing ABC (Aluminium – Brass – Chrome) configuration engines and one of particular note was Gen Saito.

From the name you probably reasoned he was connected with Saito engines, in fact he was the man behind Saito... Mr. Saito himself. Although he produced a few

spark ignition two stroke engines for the American market, his main endeavours centred around four - stroke engines, both single and multi cylinder.

His very early engines were fitted with hard chrome plated brass liners that were glued in position. Generally quite effective, with the rare occasion of a liner slipping down. He later fitted small grub-screws to retain the liner and, later still, the liners were a press in or shrink fit in the cylinders – all his engines were ABC configuration.



Nickasil surface coating is now used in all Laser engines and they have a reputation similar to the O.S. liners of not showing signs of wear even after, possibly, hundreds of hours of use

Now, except for a very early .80 twin, which had lapped pistons, all his engines were and still are fitted with piston rings... Amazing – ABC engines with rings.

The ABC configuration was quick to catch on, with many other engine brands jumping on the band wagon. And that included some of the larger petrol engines for model and hand tool use.

While it is still a very popular liner style, particularly for very high speed engines such as pylon, control line speed and tether car engines (niche market engines, generally) in our world of constant cost reduction a method of further cutting production costs led to the elimination of the separate liner. Again, one of the leaders in this field was the Saito company, who introduced another configuration – AAC (Aluminium-Aluminium-Chrome). I cannot offer even a guess who, or where, the process was developed, but it must have been a simultaneous development in many countries or several manufacturers as there is no patent on the process of chrome plating an aluminium surface. And, more importantly, an aluminium alloy surface whilst maintaining temperature stabilisation.

It's all well and good being able to plate an aluminium surface with chrome but they have different coefficients of expansion. You certainly don't want the chrome cracking or peeling off when the aluminium alloy heats up. So whoever, or wherever, the process was perfected it was done correctly and this provided a great leap for many large engine manufacturers in both the model engine industry and for hand tool engines.

One thing for sure, from my experience, Saito has it down pat as a problem with the internal chrome plating of the cylinder is almost unheard of and they just do not wear out. But there is a downside that, generally, does not affect our model engines...

When used in an engine run on straight petrol (or methanol) its metallurgical properties prevents sufficient levels of oil retention. To overcome the problem a chrome bore requires specialised honing techniques, plus the inclusion of micro size oil pockets etched into the wall of the liner (or cylinder) to assist with the required lubricity. Since all our model engines (that I know of) run on a petrol mixture (oil included with the fuel ingredient) the problem of lack of lubrication is not an issue.

In the 'big' world of engine development and production our engines don't even get a mention. They are probably not even known, so all developments are aimed at full sized engines. But we can still profit from that.

There's no doubt that the manufacturers of model engines and hand tool engines would have their ear to the ground concerning large engine developments and one place to keep a watch on was the race track. Especially what was being done to full size car and motorcycle engines to extract more and more power, and higher usable rpm.

When you consider that all our model engines run at very high rpm it is logical to see what is being done in the full size, high performance stakes, and which could also apply to our model engines.

Get Your Coat

Following on the heels of the chromed liners several other coatings were developed and all with their own merits. The O.S.

company carried out many experiments with a great deal of success. One of the first was the ABN configuration (Aluminium piston – Brass liner – Nickel coating) and this was (is) a very slick surface coating for high performance, non-ringed engines.



Saito really nailed it when they developed their inner surface coating. It is the hardest chrome possible and another 'never wear' surface. Somehow, they were able to overcome the expansion of the cylinder causing a problem as it is well known that their chrome really sticks, with no de-lamination problems

Moving into the really advanced age, the next was ABL, a special development by O.S. that employs a double layer of super hard nickels, which are deposited on the liner with a process unique to O.S., and this is employed for their super high rpm engines.

While all this was going on in the model engine industry a coating was developed for very high performance, full size car engines and it was catching the attention of engine manufacturers worldwide. It was developed in 1960 by the billion dollar Mahle company in Germany under the trademark of Nickasil, following many years of testing and research. The motor industry quickly jumped in and, in double quick time, this composite coating was used under licence by Honda, Polaris and Rotax, and later followed by many others.

In essence it is a Nickel Ceramic Composite coating process composed of a metal matrix composite using hard nickel and various forms of ceramic carbide particles. In a very short time the process was adopted in Formula 1, motorcycle engines, jet skis and race engines used by Porsche, Ferrari and many other high performance engine manufacturers.

One manufacturer of particular interest to us is Neil Tidey, the developer and manufacturer of the high quality Laser four - stroke engines. His first engines utilised hard chrome technology. Then, when he saw the potential of the Nickasil process, he had his cylinders (with an integral liner) coated, which further enhanced the legend that Laser engines never wear out.

On that last thought, in the full size industry it was found that the Nicasil (NiSC) coating on cylinder liners or engine block bores outlasts a cast iron bore by a factor of 10 (it is also 10 times harder than cast iron) and at least 2% to 5% gains in horsepower are recorded. The process is now well recognised worldwide and goes under a number of company names such as NiCom, Apticoat, Ceramic 2000 and Electrosil. There is little or no variation in the actual process but the quality of application can vary.

It is now used in many petrol engines, MVVS as an example, and we will see it used more and more as other companies see the benefit and the availability of processing companies grow and expand.

Already on offer from a number of companies is the repair (TIG welding) of aluminium alloy cylinders, re-boring and internal coating with Nickasil, etc. But there are limits for this as the final stage after the coating is the honing and here a multi head diamond hone is used, and these don't come cheap. Generally, they are hydraulically driven and they have around eight heads to provide the critical precision required, such as parallelism, size, roundness, taper and surface finish – the last of which is important for oil retention, maximum engine power and minimum ring wear. When you look inside a bore you can see the cross hatch pattern in (roughly) a number of figure of 8 scratches.

All this great technology is just for liners but the pistons and rings must also be up to scratch and we will look at these in my next article. **RCMW**

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Super Javelot

In the last issue Chris Williams started to detail the construction of his new Wassmer WA 22 scale glider. We left the build with Chris detailing the sheeting of the centre panel. Now it's time to mate it to the fuselage...

MODEL WORLD

AT A GLANCE

NAME:	Wassmer WA-22 Super Javelot
SCALE:	1:3.25
SPAN:	4.6 m
WING SECTION:	HQ35/14 (centre section) to HQ35/12 (wingtip)
LENGTH:	2.2 m
WEIGHT:	9 kg (20 lb)
RADIO FUNCTIONS:	Throttle, Ailerons, Elevator, Rudder Brakes
SERVOS:	Standard Futaba and Corona wing servos

BASIC CONSTRUCTION

MATERIALS:	Balsa, Ply, Spruce
COVERING MATERIAL:	Solartex and heat-shrink film
CENTRE OF GRAVITY:	90 mm
CONTROL THROWS:	Elevator – 45 mm up, 30 mm down Rudder – 70 mm each way Ailerons – 35 mm up, 20 mm down
MIXING:	Ailerons come up with airbrakes by approx. 10 deg. for improved glide-path control

OPTIONAL E-ASSIST

MOTOR:	Turnigy G60 Brushless Outrunner 400 KV
PROP:	aero-naut 14 x 8 folding
ESC:	85 A with 5 A SBEC
BATTERIES:	2 x 3S-2700 mAh LiPo



The Super Javelot in action at White Sheet

One advantage of a three piece wing with a bolted-on centre panel is that a D-connector can be used to speed up the rigging process. First though the wing panel must be bolted to the fuselage. Offer up the wing, check for alignment (the drawing of centre lines in as many places as possible is always helpful), then drill through the 6 mm hole in the aluminium bracket into the wing mounting plate and the bracket in the fuselage. Glue a 6 mm captive nut to a piece of 6 mm balsa sheet and glue it to the underside of the bracket in the fuselage.

Now bolt up the wing, check once again for alignment and drill through the solid balsa at the rear of the centre panel into the wing mounting plate on the fuselage. This time glue a captive nut to a strip of 6 mm ply

and epoxy it to the underside of the wing mounting plate in the fuselage.

Now for the D-connector... Screw the female side of the connector into a 1.5 mm ply plate and glue it to the underside of the front wing mounting plate. Now, stick a couple strips of masking tape in the appropriate area, bolt up the wing until the connector touches the tape, then remove the wing and the marks on the tape should show you where to cut out the aperture in the lower wing sheeting.

Glue a strip of 1.5 mm ply to the sheeting inside the wing with an appropriate aperture for the male connector and offer the connector up. You will probably find that the female side will need to be shimmed up with a couple of washers to achieve a full fit.

Outer Wing Panels

The procedure is similar to the centre panel. Note that the bent aileron spar is reinforced inside the join with a piece of 0.8 mm ply. As with the centre panel, when adding the 3 mm sheet to the wing joiner box, note that the boxes are handed such that the brass box protrudes through the front edge of the spars. When placing the wing on the jiggging supports to add the top sheeting, pack up the TE by 1.5 mm to make up for the sheeting that has yet to be added to the aileron spars.

Once the wing sheeting is fixed, trim off the front edge of the wing and add the 6 mm leading edge.

Now the strips of 1.5 mm balsa sheet can be added to the aileron spar, top and bottom. Now is a good time to set up the fit of the outer panels to the centre panel. As with all three-panel wings there is little room for adjustment, so the fit has to be precise. Insert the 4 mm brass tube into the outer and centre panel at one side and slide the wing panels together to check the fit. If the TEs don't quite align properly ease out one or other of the holes in the wing root to achieve a perfect fit. Once satisfied the tubes can be secured with balsa top and bottom and plenty of cyano.

Now finish off the balsa sheeting and cut out the 1.5 mm ply wing root facings. Epoxy one to the outer panel, then offer up the panel to the centre panel, with the second ply facing loosely attached, and check the fit. When satisfied, epoxy the second facing in place and sand the edges to finish off. Fine finish can be achieved later with a skim of filler. Now repeat the process for the other panel.



Closing off the wing joiner box with 0.8 mm ply webbing

Ailerons

The ailerons are fairly simple to make and quick too when using CA to put them together. Start by pinning the TE to the board. Then cyano the root and tip ribs in place on the 6 mm balsa LE, using the plan to align them correctly. Now, pin the LE to the board and glue the two ribs to the TE. The LE will now assume the correct angle. Add one of the centre ribs, ensuring as you do that the LE does not become bowed in either direction, before adding the remaining ribs. Double up the root and tip ribs and then start to glue in place the diagonals that will stiffen up the aileron and help to prevent it twisting. Note that the diagonals will need to be trimmed to fit but don't worry about a perfect fit as this would be very difficult. Once completed the aileron can be carved and sanded to its final shape – be sure to use a perfectly flat sanding block. The job of the diagonals is to render the aileron rigid.

Hinge the aileron to the wings using two flat hinges per aileron. These will not be glued in place, instead tape will hold the ailerons to the wing, allowing for easy disassembly at a later stage. The purpose of the hinges is to hold the aileron level with the wing, something that tape alone cannot achieve.

Now the servos can be fitted. 3 x 6 mm spruce rails, glued transversely between the ribs, hold the Corona wing servos, with 6 mm square balsa rails above them to reinforce the joint.

Fill in between the ribs/diagonals on the ailerons with block balsa, then drill out for a short length of 9 mm hardwood dowel. The dowel is drilled out for a Multiplex threaded aluminium horn. If the hole is drilled out slightly under-size the horn can be inserted in a drill and wound securely into the hole. Make up a threaded pushrod for the aileron/ servo connection, with a Z-bend at the servo end.

The rest of the lower sheeting can be added, leaving an aperture for servo access. There's no need for a hatch cover; a vinyl patch will eventually cover the aperture after covering. The aileron servos on the prototype were Y-leaded in each wing to cut down the number of pins needed in the D-connector.



Ailerons are built flat on the board



View of starboard wing structure

Canopy

The canopy on the prototype was designed with the E-Assist in mind, whereby it is necessary at times to change the flight batteries. Therefore the canopy just simply lifts off, with a locator at the front and three 8 mm magnets at the rear. For those that prefer a scale set up it shouldn't be too difficult to fit the normal hinges and catch. Another complication that has been simplified concerns the rounding off of the corners where the canopy frame sits on the aperture. The diameter of the corners has been slightly reduced to allow for an easier framework build.

Start by making up the curved side rails. This is accomplished by laminating two lengths of 3 x 6 mm spruce together and clamping them to the sides of the cockpit aperture to allow them to take up the shape. A 1.5 mm spacer is placed between the rails and the fuselage to allow for spring-back. Cut out C1 and C2, and clamp them to the fuselage in the appropriate positions. Trim the rails to form a butt joint at either end. Mask out the corners of the aperture to avoid the frame sticking to the fuselage and epoxy the frame together.

Next, make up curved gussets from 6 mm ply and glue them to the framework at the four corners. Round off the corners with a sanding block and use filler to tidy up the joints. In a similar fashion, cut out four curved gussets from 6 mm ply and glue them to the corners of the canopy aperture on the fuselage.



Canopy framework



The basics of the airbrake system

Airbrakes

The airbrakes that are about to be described are not the easiest to make or install. If you would prefer simplicity to realism then a top mounted set of commercial airbrakes will do the job.

The airbrakes are designed for the occasional landing on rough ground, where vegetation might grab at the lower blades if not retracted swiftly enough. It is also worth considering that if the pivot arms should become damaged, repairs would be next to impossible and the wing possibly written off. The arms are therefore made up from 12 x 6 mm spruce.

The blades are screwed to the arms with miniature screws and they should simply rip off if hit by an obstacle, which is a much simpler repair. Also, because the full size airbrakes are drilled out with lightening holes and are therefore an obvious scale feature the blades are made up from 3 mm balsa, which can be drilled out neatly with the aid of a sharpened tube in a drill.

First, make up the base from 3 mm balsa and insert the 3 mm ply plates for the arm pivot screws. Make up a template for the arms with the holes drilled out and use this to make up the 12 x 3 mm spruce arms to give the mechanism some semblance of consistency.

Screw the arms into the base, leaving a 3 mm gap into which the blades can be slid. (A washer will be fitted between the arm and the base when final assembly takes place.) Draw a centre-line on the blade and offer it up so that its lower edge lines up with the centre-line on the base. Arrange the arms so that the holes drilled out in them line up on the centre-line and prick through with a pin.



Fitting the airbrake to the wing

Drill out the blade where the pin pricks are, remove and screw on the other side of the pivot arms. The blade should now swing in and out and line up with the centre line in the closed position. Repeat the procedure for the other blade. The correct set up is when both blades close together in parallel alignment. Now would be a good time to clean up and paint the pivot arms so that they won't have to be removed later, and also cut out the lightening holes with a sharpened 8 mm tube.

Make up a pushrod with a quick link and fit a horn to the inside pivot arm. On the prototype a small eyelet was used; a small part of it was snipped off with wire cutters and the hole closed up for a snug fit with the quick link.

Now attention must turn to the wing centre panel. Mark out for the 6 mm square balsa spars, in between which the airbrake assembly will fit. Cut out the slots with a junior hacksaw. The blade of the hacksaw is 5 mm in depth, so it's pretty easy to see how far to cut. Once the spars have been fitted, top and bottom, use a large hacksaw blade to remove that portion of the ribs in between the spars.

Now, cut out an appropriate slot for the pushrod in the nearside rib and trial fit the airbrake assembly. Arrange the base plate so that the closed airbrake blades sit centrally and then cyano it in place. Glue in place pieces of 6 mm square balsa strip at each end of the aperture, leaving a small gap for

the end of the blades. Trim off the excess parts of the base plate and sand the area smooth and level.

Due to the length of the airbrake aperture the TE is unsupported over a large length. This is obviated somewhat by means of the diagonal 3 mm balsa TE supports (TES). Trim the blanks to a fit and PVA in place.

Make up the first of the 1.5 mm balsa sheeting, tape in place and prick through with a long pin at each corner of the aperture to mark out where the slot will be, then cut out the slot. Then glue the sheeting in place. Repeat the procedure for the other side.

On the prototype the airbrake sheeting was fitted separate to the wing root sheeting and the join was facilitated with 3 mm balsa strips on the appropriate ribs. Once the glue has dried, the blade caps can be glued in place. These consist of a 0.8 mm base, with

whatever thickness of balsa is required to bring them just above the level of the wing. Then the blades can be sanded flush with the wing.

Unless you are setting up the airbrake servos in separate channels they will have to be Y-leaded, so remember to set up the servos so that they rotate in opposite directions. (Separate channels would require a 12 pin D-connector between wing and fuselage.) Note also that the rear airbrake spars will need to have 1.5 mm balsa webbing plates between them to strengthen the unsupported ribs. Leave gaps for the pivot screws so that final adjustments can be made before covering the wing.

Connecting The Wings

On the prototype a Multiplex MULTlock wing retaining system was used. Two sets

were used, one in front and one behind the joiner. It's important to know that there are three strengths available for the retaining force and it's best to use the weakest, otherwise you will never get the wings apart!

Drill out the holes for the female coupling first and epoxy the locks in place. Insert the male parts, place three or four layers of masking tape in the appropriate place on the opposing wing and push the wings together. Use the dents in the tape to locate the holes for the male parts and drill them out. Now mask out both wing roots, coat the protruding parts with epoxy and join the wing together until the epoxy sets.

On the prototype, the procedure had to be repeated more than once before the system finally worked.



Wing fairing structure



Diagonal supports in the wing to support the TE

Wing To Fuselage Fairing

This has a rather complex blend of shapes yet it can be sheeted with one piece of ply. First make up the 0.8 mm ply base, with the dominant grain crosswise. Attach the wing centre section to the fuselage, tape in place the front and rear formers. Shim the rear former with 0.8 mm ply to create a gap, then use the vertical 3 mm lite-ply spine to force the ply into the shape of the wing's upper surface.

The easiest way to fix it is with some decent medium viscosity cyano. Glue the front and rear formers to the base and the spine with more CA. Use some scrap balsa to fill in the narrow shape of the join at the front then add the intermediate formers each side of the spine. Still with the structure in place, cyano 3 mm balsa strips to the edges of the base plate, masking off the wing to avoid any unnecessary contact. Now remove the fairing and add 3 mm balsa to each side of the spine and the intermediate formers to increase the gluing area.

On the prototype the fairing was retained with the use of four sets of 10 mm circular magnets. Mark out the two holes at the front and rear with a small drill. Open out the holes with successively larger drills until a 10 mm hole is achieved. Glue the magnets in flush with the surfaces with epoxy, ensuring the correct polarity each time. The fairing structure should now sit comfortably in the space above the wing. Check that it sits within the thickness of the ply covering inside the front and rear formers. It would be ideal to glue the 0.8 mm ply sheet with the



View of the tail end

fairing in place on the wing but as that is not practicable it will have to be removed first.

As the structure will easily twist at this stage it needs to be stabilised by temporarily gluing it to a piece of 12 mm balsa sheet. Support the fairing with a piece of transverse balsa

between the fairing and the base support. Now the ply sheeting can be added. Use PVA and wide masking tape to hold everything in place, pulling gently on the ply to force it in place.

SUPER JAVELOT

E-Assist

You may not want to bother with the E-Assist, regarding it as one more complication. But on the plus side it does dramatically increase the occasions when you can go flying and when not needed the prop can be removed and the shaft hidden to restore the model to a pure glider again. (Note: the following procedure is identical to the ones that converted my Bergfalke 4, Dart 17R and Zugvogel models to E-Assist.)

The first job is to drill out the central hole for the propeller shaft. There's not really any scientific way to do this so it's best to start out with a small diameter drill and work you way up to a 12 mm bit. Aim as far as possible to keep it central and parallel to the fuselage side view. Since the front bulkhead may have resin on it, it's best to make up a 6 mm plywood ring for the motor to mount on. Use short screws to attach the motor to the plywood ring and epoxy the ring on to the bulkhead, ensuring that the shaft is central to the hole.

I should point out here that my pal Smallpiece replaced the shaft with a longer one and he also supplied the bearing that will fit inside the nose.

Now for the trickiest part – drilling out the 10 mm cooling vent holes. There are two of these under the prop shaft. Once again start with a small diameter drill. The shaft should aim to come out inside the plywood ring. Having succeeded on one side, insert a length of tube so that it will serve as an alignment guide for the second hole.

The current procedure allows for the bearing to sit deep enough inside the nose for most of the propeller hardware to sit inside, with the added side benefit that the shaft is then almost flush with the nose and can be more easily hidden when not in use. To drill out the rather large aperture for the bearing required a large brace and bit on the prototype!

When all is satisfactorily in place the vent holes can be partially lined with 10 mm brass tube, which will allow a very neat opening when the final sanding and shaping is complete.

The Turnigy G60 400 KV brushless outrunner has so far proved very successful with the previous E-Assist models. A new, longer shaft will need to be fitted, facing the opposite way. Coupled with the Turnigy brushless 85 W/5 A SBEC and 2 x 3S LiPos, there is ample quiet power to get out of any height related trouble. The receiver has a separate 3S LiPo and 6 V voltage regulator. For the propeller you will need the following aero-naut items:

AERO7242.23 - Prop Hub Yoke 47 mm/
8 mm bore

AERO7124.05 - Collet Adaptor M8 for shaft
6.0 mm

AERO7234.68 - aero-naut CAM-Carb-
Blades 14 x 8

The blanking plug is made up from a small length of brass tube that slides over the shaft, with a 2 mm ply back plate. The rest of the shape is made up from balsa sanded to blend in with the shape of the nose.

Covering And Finish

The wings and tailplane of the prototype were covered in Hobbyking film, the fuselage in Solartex. The extreme compound curves at the nose were left uncovered and the 'tex joins brushed over with two-pack primer and flatted smooth. The fuselage was then sprayed with two-pack primer and flatted with 600 W&D prior to applying the top coats.

When applying the trim colours the film was roughed up with red Scotch-Brite and sprayed with an aerosol plastic primer. All the top coat colours were from activated two-pack paint, sprayed on.

You can download a photo-pack of the full size aeroplane from the Retroplane website: <http://www.retroplane.net>



Motor shaft bearing is recessed in the solid nose. Note the cooling vents underneath



When not in use the motor shaft is covered by a blanking plug



Right:

Gear arrangement in the cockpit – loads of room!

Rigging And Flying

If built to the plan this model is a quick one to rig, with the exception of the tailplane. Since the retaining bolt sits under the rudder, and the Corona servo is difficult to manually move, it was found expedient to remove the pushrod and tape it to the cockpit floor. Obviously, the elevator will need to be connected to the pushrod once the tailplane is bolted on.

The wing centre panel D connector connects automatically with the fuselage when it is bolted on, leaving only the single plug and socket for the ailerons when the outer panels are fitted. A quick thump on the wingtips will connect the wing together and a smart thump on the LE will separate them again. The connectors let out a sharp crack when being separated so warn those of a nervous disposition that might be standing nearby!



'This way, Chris?' Geoff Crew launches the Javelot at White Sheet



On light wind days E-Assist can prevent a walk to the bottom of the hill. It must have been blowing okay when this pic was taken as there's no sign of the 'moustache'!

The wing fairing and canopy are simplicity itself thanks to the magnets. For access to the batteries the instrument panel is just wedged between the top longerons for quick removal and replacement.

The ailerons are mixed to come up slightly with the brakes. This combination makes for very effective glide path control. In flight the model should have no undesirable characteristics and the stall should be extremely safe. Although this glider is a bit larger and heavier than its E-assist predecessors, even with the same power train, there is still plenty of power for height gain should you need it when the lift dies.

Thanks to Smallpiece's o/d, slim, side-fitting tow release the Javelot has proved to be super stable on tow and the distinctive dihedral on the wings makes it easy to pick out from other gliders.

That's it! The Super Javelot is a relatively lightly loaded glider with the ability to fly in a wide range of circumstances. Although not a simple build the reward is a striking looking model that flies well and stands out a little from the crowd. **RCMW**



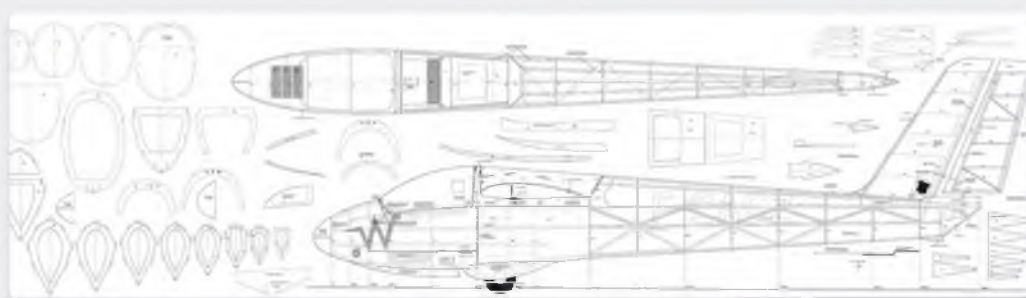
Simply soaring overhead

CONTACTS

c_williams30@sky.com

PLAN DETAILS

- PLAN NAME:**
Wassmer WA 22 Super Javelot
- PLAN NUMBER:**
MW3813
- PLAN PRICE:**
£31.50 (\$41.00)
- LASER WOOD PACK:**
WP3813
- WOOD PACK PRICE:**
£154.99



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Hawker Typhoon

Josh Spiers sprints to assemble a new FMS warbird in less time than it takes for the big hand to get half way around! With flying pictures from Roger Laskey

Affectionately known as the 'Tiffy' this new 1100 mm EPO foam version of the Hawker Typhoon from CML Distribution is an absolute beauty. It arrived in an attractively illustrated box, carefully packaged in a foam container and with all of the parts taped in place to prevent any transport damage.

This is about as ready to fly as it gets, with the parts count for the airframe amounting to just four pieces. The fuselage is complete with its motor and ESC, needing only the prop and spinner to be attached. The one piece wing has servos for the flaps and ailerons in place and connected up. Finally, there are the two tailplane halves.

There is a bag containing the four wing cannons, the carbon tailplane spar and the seven screws for holding it all together. In another compartment is the scale looking green three blade spinner of approximately 3" diameter, with a matching three blade nylon prop marked 10/5-7. Like I said, not a lot in the box and even less to do!

A Closer Look

With the one piece wing being the first part out of the box a quick 'gander' would seem to be in order. The metal trunnion electric retracts are firmly fixed in place and they include partial wheel well doors securely fitted to the legs. The FMS 9 g servos for the ailerons and the inboard flaps are secured in place and connected to the respective control surfaces.

Turning the wing over reveals a small black junction box sitting in a central recess, with three servo leads exiting it that connect to the receiver, labelled channels 1, 5 and 6.

The surface of the wing is nicely painted in WW2 grey and green camouflage, with yellow painted outboard leading edges.



With control settings as per the manual the FMS Typhoon is very smooth and easy to fly



The kit arrived in an attractively illustrated box



This is about as ready to fly as it gets, with the parts count for the airframe amounting to just four main pieces



The plug-in elevator joiner and carbon rod keep everything aligned at the tailplane



Wing servo wiring is kept tidy by use of a central distribution box



The wing is fully rigged with working flaps and electric retracts



Outboard of the wing the ailerons are well set up



View showing one of the deep tailplane recesses and the rudder and steerable tailwheel connections

The inboard section features two black invasion stripes to finish off the wing. The roundels are also stuck in place, giving a nice, crisp look to the whole assembly, which carries over to the fuselage and tailplane halves.

Next up is the fuselage, which comes with a quality motor and ESC already installed. The motor is an outrunner of 850 KV; it has all the looks of a high quality piece of kit and it is connected to a Predator 40 amp BEC ESC. Two decent servos are fitted side by side in the rear of the battery bay for the elevator and rudder/tail wheel steering, operating pre-fitted wire pushrods connected to the aforementioned control surfaces.

The removable cockpit hatch is retained with a magnet at the rear and it includes a fairly scale looking fly-boy, which is a big plus. The pilot is enclosed in a robust clear canopy, with a nicely painted framework. I have to say that the scale detailing on this Tiffy is excellent for a foamie and it does FMS and CML Distribution great credit for the high quality achieved overall.

A Spare Half Hour

So on to the assembly, which I timed in the interest of the review. Half an hour, give or take, including gluing the four cannons into the moulded recesses on the wing leading edges.

At the rear simply slide the carbon rod through the tailplane recess, slip the two halves on, retain them with the two screws provided and connect up the two pushrod clevises – job done!

Turn the fuselage over and drop the wing in place, feeding the three servo leads through the hole into the battery bay and secure with the four long screws provided. Turn the model over and connect all the leads to your chosen receiver and set up the controls using the suggestions on page 10 of the manual.



The battery bay has ample room for a 3S-2200 LiPo



Motor access is a cinch thanks to the Typhoon's large diameter cowling



Josh shows off the small but smart FMS warbird



Taking-off for the maiden flight



Despite only being 1100 mm in wingspan the Typhoon really looks the part

The model requires a 3S LiPo of 2200 mAh capacity to power it. I used an Optipower Ultra 3S-2150, with a 50C rating, which really made the model extremely fighter-ish in the air and it also offers fairly good duration if flown in a scale manner. The manual tells you to check the motor's direction of rotation before fitting the prop and spinner to the airframe. Obvious, I know, but it still happens!

The only thing that I changed on the model were the battery connections on the ESC to match my preferred 4 mm gold connectors that I use on all my small to medium model set ups. Whilst we are on the subject of the battery, I have to say that the removable battery tray in this model is a stroke of genius, in the way that it slides in and out of the nose section, down some plastic guides. This enables the fitting of the LiPo into the tray when outside of the model. With the LiPo firmly Velcroed in place to the tray, just slide it back in and connect up the lead and you are ready to go. Nice...!

With everything in place and my Spektrum 6 channel receiver connected up, but with no prop fitted, I set up the model ready to fly. The retracts worked a treat, going up and down at a fairly scale rate, and I checked that all the surfaces were equal and in line with each other. I dialled in 40% expo on the ailerons for the first flight but I used no rates on anything, just going with the standard 100%. The flaps were spot on out of the box so to speak, so I left them alone to check them out in the air.

With the prop fitted and the 3S Optipower LiPo connected up, I took a watt-meter reading, which recorded 33 amps/360 watts, indicating plenty of power for this small warbird.

Ready To Go

We just needed a good weather day and Roger with his trusty camera to be on hand to get it done. That day soon arrived and it found us up on the common, ready to go. All the usual checks and ground shots were done, so with Roger poised and ready the Tiffy was placed on the smoothest bit of our rough winter strip and away we went.

Timing is everything in order to achieve a smooth tail-dragger take-off on our strip, especially with a small, light model. And with all the banter flying around from your watching clubmates (none of which can be printed in this magazine!) concentration needs to be at its highest level.

So with up elevator and bags of throttle, after a short run I eased off the elevator as the mains broke ground and I hid a smug grin as the Tiffy climbed away perfectly with the gear winding in. 'Fluke!' is the only printable word I can put in here from the assembled throng; they might think that, but I couldn't possibly comment...!

The first circuit showed that I needed a couple of clicks of aileron trim, with the elevator being spot on. So far, so good. With Rog snapping away like a demented cricket, left and right passes were executed, with loops and rolls bunged in for variation and to keep him on his toes.

I have to say at this point that the model was so smooth and easy to fly, and the thought that this was a 'maiden' never entered into my consciousness for the whole of the eight minute flight. With the Tx beeper sounding off a landing was called and I brought her in, with no flaps for this first

landing, as there was a fair bit more breeze than usual for her to come down into. Down the glide slope she came, smooth as a snake on ice, and the mains touched down perfectly. After a lovely roll out and... Oh dear, the Typhoon was up onto its nose and over on to its back!

'Pilot wounded in action and lucky to get down!', said I. Not that anyone heard me over the barracking I was receiving from all the assembled 'professionals' standing behind me. Modellers, don't you just love them?

On the second flight half flaps were tried for the take-off, with full flap engaged for the landing. The take-off is very smooth and shorter at half flap, as you would expect.

They definitely help when getting away from the rougher winter strips that many clubs have to use, reducing the take-off run by about half. With full flap on a very much shorter landing circuit is required. And as there is virtually no trim change if they are dropped at about third throttle or under, picking your spot and nailing it is well within the capabilities of most pilots.

Summing Up

Let's sum up the flying qualities of this smart little warbird. On the control settings in the manual it is very smooth and easy to fly – a perfect first warbird for the club modeller. You could, if you had a mind to, go to town and practice your weathering technique for

a bash at your first scale comp – it certainly looks good enough in the air to hold its own with others of its ilk.

The Typhoon is as aerobatic as you want it to be, dependant on your settings, with nice large loops and fairly axial rolls. Inverted is easy-peasy, with just a smidgen of down required to achieve level flight. And inverted circuits can be flown with confidence. The rudder will hold it in knife-edge, if you want to abuse it, but it better excels at scale flying, swooping and rolling before ripping down the strip for a strafing run. The sort of stuff that fighter bombers look their best at doing. Go on, you know you want to!

What more can I say? The FMS Hawker Typhoon is a little beauty! **RCMW**



With full flap a very much shorter landing circuit is required



The first landing was made without any flap due to the stiff breeze



After a lovely roll out the Typhoon was up onto its nose and over on to its back. Well caught, Roger! Josh got plenty of barracking for this one but subsequent landings have been easy to nail, after dropping the flaps at about third throttle and picking a spot on the runway



The FMS Hawker Typhoon is a little beauty!

MODEL WORLD

MODEL INFORMATION

NAME:	1100MM Hawker Typhoon
MANUFACTURER:	FMS
DISTRIBUTOR:	CML Distribution
PRICE:	RRP £174.99
WEBSITE:	www.cmldistribution.co.uk (search FS0224)
MODEL TYPE:	WW2 warbird
CONSTRUCTION:	Moulded foam
PARTS SUPPLIED:	Airframe, brushless motor, ESC, servos, electric retracts
PARTS REQUIRED:	Transmitter, 6-channel receiver, 3S-2200 mAh 25C LiPo

R/C FUNCTIONS

1. Throttle
2. Aileron
3. Elevator
4. Rudder
5. Retracts
6. Split Flaps

MODEL SPECIFICATIONS

WINGSPAN:	1100 mm (43.3 in)
OVERALL LENGTH:	845 mm (33.3 in)
FLYING WEIGHT:	1300 g (45.9 oz)
MOTOR:	Brushless outrunner, 850 KV
ESC:	40 A
SERVO:	6 x 9 g
RADIO:	6 channel
PROPELLER:	10.5 x 7 in, 3-blades
BATTERY:	3S 1300 mAh LiPo

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Scale Soaring

Chris Williams meets up with other scale gliding enthusiasts at the Ghost Squadron Aerotow, Middle Wallop on 22-23 April



Roo Hawkins' DG 800 on its maiden flight



View of the Ghost Squadron event from behind event director John Greenfield's 1/2 scale Wien

Due to the postponement of the previous event due to inclement conditions, the White Sheet Scale Fly-In, this classic fixture of any year's event calendar, became the first event of the 2017 season. How special then to have a forecast of high pressure with light winds and absolutely no rain!

The first order of the day was to have a mosey around and see what new had been put together over the previous winter months. Scratch building, normally the preserve of

those who like to make things out of wood, took a twist when I beheld the third scale DG 800 of Roo Hawkins, whose fibreglass adventures we had been following on the SSUK forum. Roo's involvement with surf board manufacturing makes him uniquely qualified to mess around with fibreglass laminations and filler application, and his previous efforts with similar projects have stood him in good stead with this, his finest effort yet. Brave lad that he is, he was fully determined to fly the maiden, even with an

audience of thousands... well, hundreds... well, all right, an audience. In the event, after a little hasty trimming, the model flew very well and he pronounced himself well satisfied. The fun came to an end later in the day when a forced downwind landing caused some most unusual damage – he broke the tyre in two! Well done, then, Mr H. for a job well done, and we look forward to some more online entertainment in the coming winter months.

It has been quite some time now since Ghost Squadron impresario John Greenfield designed the first Greenley tug. Since then the variants have grown bigger and bigger – the Super Greenley, the Super-Duper Greenley, and the Super-Duper-Duper Greenley. It took my pal Smallpiece to add a new twist to the tale by building a version with a self-starter. Needless to say, when he trotted it out the flight line and it magically burst into life all by itself, it caused a certain amount of banter and the extraction of wee-wee, the consensus being that the lad was becoming a bit of a show-off. However, after a hiatus of a few years, it was good to see him return to the fold of the tugging fraternity.

One other item of interest on the SSUK forum over the winter months was the group build of a fifth scale Slingsby T21 by Frank Skilbeck and his band of merry men. This Mike Trew plan dates back to when Fred Flintstone wore short trousers and little was known about the comparisons between scale and non-scale wing sections. There was much interest and concern from the group as the model was hooked up behind a tug. But as it turned out the T21 proved to be a real floater and she went on to perform several



Roo Hawkins with his scratch-built 3rd scale DG 800



Frank Skilbeck (left) with his co-conspirators in the T21 group build

flights over the day on the Sunday.

My old pal Motley had brought along his newly completed 3.5 scale Schweizer TG3 to the party and we were able to pair it with John Lawrence's 1/4 scale version, built many years ago by Colin Cousins. Someone (it wasn't me guv, honest!) came up with the bright idea of a simultaneous launch of the pair of them and I have to say Motley was looking a bit dubious as they hooked up the tugs. 'What can go wrong?', I assured him, which didn't seem to help at all. In the event there was no drama and the pair of them made a fine sight as they took off together.

The weather was every bit as good as promised, although more than a trifle chilly on the Saturday morning, and the lift at

times uncomfortably good, which is the description I apply when, with brakes out and a tight spiral dive initiated, the vario still tells you the model is going up! Due to a change of administration at this military airfield, new arrangements had been put in place that saw us unceremoniously evicted from our customary spot in the middle of the airfield and banished to somewhere near the circumference. But it all seemed to work well over the weekend, at least for that particular wind direction.

For me the highlight of the weekend was in learning the incorrect etiquette when it comes to introducing yourself to a bird of prey. Spotting a Red Kite circling lazily in lift, I flew my Zugvogel over to see if I could join

the party. Due to the clumsiness of my aerial gyrations, he had to spin hurriedly out of my way, after which he started to circle behind me. Deciding discretion was the better part of valour, I scooted off in a straight line, only to have him follow close behind. I circled, he circled. I flew straight, he flew straight, always close behind. In the end I could only lose him by initiating a spin and by the contemptuous lazy flap of his wings I could easily discern what he was thinking, which roughly translated went, 'G'arn, yer pussy!'

As an introduction to the season's festivities, this was definitely a good 'un. The usual thanks must go to the Ghost Squadron boys and girls, and the tug pilots for making the weekend so special.

SCALE SOARING



Line up of the ever popular Greenley tugs at Middle Wallop



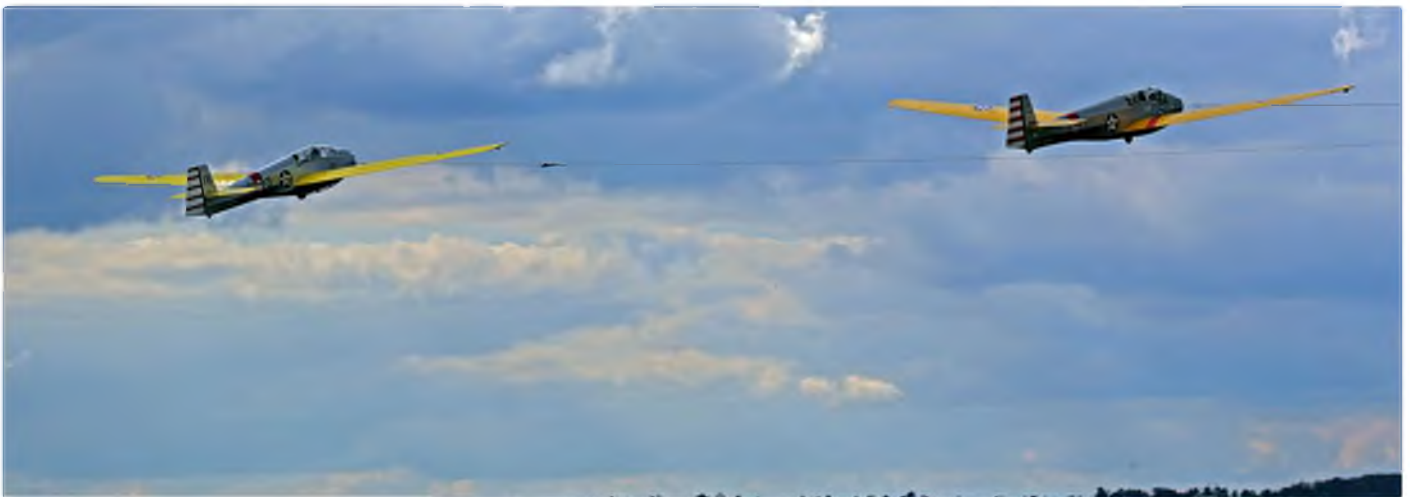
Slingsby T21 on its maiden flight at Middle Wallop



An ASW 17 gets a tow from a non-Greenley



E-Assist Quintus on tow at Middle Wallop



Twin launch of the wartime Schweizer TC3s



Darren Maple's 1/2 scale Camel in action

In The Workshop

Some time ago I had built a version of my 1:3.5 scale Topaze design, of which I was very fond. Finished in a red, white and blue livery, I thought it looked the bee's jointed extremities, and it was about this time I started to use the then new FrySky Taranis transmitter system. The main reason for changing over from my previous radio was that the telemetry systems, including the vario, were at bargain basement prices. This meant that each model could have its own vario, and thus all the fuss of swapping varios from model to model could be avoided. (I've lost count of the times I've arrived at the front of the aerotow queue only to find the vario was still in another model!)

On top of that, the voice informing the pilot of altitude and vario sounds comes directly out of a speaker in the transmitter, so no dangling a receiver around your neck – a win-win situation...

So, fast-forward to one day on the hill with my new transmitter, and I'm contentedly poling around said much-prized Topaze. Hmm, I thought, let's have a quick look at the telemetry page and see what the flight battery is doing. Reluctant to take my eyes off the model, I pressed what I thought were the correct buttons and with a single beep I managed to wipe out all the mixes. To say I was saddened by the subsequent deconstruction of the model would be an understatement. And it didn't help when later investigations revealed that to do what I had done required one-in-a-million odds. All I had left was a pair of AMT blades, a rudder and a set of airbrakes, rescued from the autopsy. With some ceremony, these relics were interred in the roof to languish until the end of time.

It's funny how eternity seems to have devalued since Brexit, because recently, in between projects and looking for something to do, I came up with the notion that the Topaze should be re-born. And to make it

a valid project, and not just another case of Repetitive-Model-Syndrome, this time it would be fitted with E-Assist. The parts were disinterred from the loft and work began. To my amazement, the airbrakes really could

be made to work again, so what with that and the fact that rear tail feathers were also ready made, the new airframe quickly came together and I look forward to seeing the Topaze re-born...



Author's late and lamented Topaze



Author's newest version of the Topaze

Sic Taranis Gloria

Sticking with the Taranis, I have every reason to be chuffed with its performance, especially with all the stuff you can do with the telemetry. But one niggle I have always had is in regard to the ergonomics when it comes to self-launching a large glider off the hill. This performance relies on the left hand to give the fuselage the necessary urge, and the thumb and finger of the right hand to steady the starboard wing, leaving the only the three remaining fingers to grasp the tranny and press it against the palm. Given the size and shape of the X9D, I'm always left with the impression that the first thing liable to land on top of the hill might be the transmitter! Recently, my eagle eye spotted a new transmitter in the Taranis range, the X7, which is slightly smaller, lighter and with two rubber grips on the back. Could this be the answer?

I used my chequebook as the key to unlock the answer to the question. And lo, it appears that the new transmitter is indeed much easier to hold and less liable to slip out of the hand, feeling a lot like the lightweight Cockpit transmitter I've been using for many years. I will now spend a fortnight in Purdah wrestling with the software, or perhaps I'll press gang my pal Smallpiece (known in intimate circles as the Einstein of the Taranis, or sometimes

even Taranistein) into service. The only worrying thing is that the new Topaze will soon be ready for the new transmitter... Can million-to-one chances happen twice?

Reasons To Be Cheerful

The other day, I thought it would be fun to count how many models I had designed and built since I retired some four and a bit years ago. I was astounded to find that the

total, including the aforementioned, came to eighteen! So, if retirement follows work, and the Grim Reaper follows retirement, just think how many models I can build once I'm pushing up the daisies...! **RCMW**

CONTACTS

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The new Taranis X7 (left)

Bell 212

Martin Briggs reviews the highly detailed 800-size Bell 212 from Roban's extensive range of large scale R/C helicopters. Pictures by Steve Tew

It's been some time since I've done a review of an R/C helicopter but having decided to take one on I can't think of a better subject to cover. This is my second Roban scale helicopter, my first being their 700-size Hughes 500E, which I acquired about two years ago. Since then there have been number of minor improvements to the mechanics, which are basically common to all their 700/800 size designs.

I'm aware that Jon Tanner quite recently reviewed Roban's Bell 407 in this magazine with these same mechanics so apart from a basic outline, I don't intend to repeat what he wrote. I'm mainly going to concentrate on the fuselage aspects of this 212, cover any changes I have either noticed or felt necessary to make during assembly and, finally, outline my findings after the first lift-off and subsequent flights.

Kit Presentation

Quick UK is the company that imports Roban helicopters and when I was offered the chance to take on the review, their MD Budd Boulton left it up to me to decide which of the six colour schemes to go with and which of the 212 or 412 options to take. Having examined all the options on the Quick UK website, I decided to go for the 212 with its two blade flybarless rotor-head rather than the more complex four bladed 412. But I left the colour choice until I went to collect the package from Pewsey, where I could examine all the options in person.

Why two blades and not four, you may ask? Well, with a good electronic stabiliser extra blades are no problem but I decided this time (for convenience only) that I wanted blades



What's not to like? This scale helicopter kit offers high quality and comprehensive prefabrication, as well as realistic performance and appearance

that could be folded back over the boom and retained in a blade caddy for transporting between home and the field. Bolting four or five blades on correctly on arrival at the flying field is only a few minutes work but it can become a little tedious, so I took the easy route. Other than the rotor-heads the only difference between the 212 and 412 design is the shape of the removable upper fuselage section (the doghouse). On the 412 the upper main-shaft is more shrouded.

Budd spent a considerable time opening all the boxes so that I could make my choice of colour scheme and I have to say that I've never seen better packaging before. Although it must represent a considerable

part of the shipping costs, it is money wisely invested because there's a 100% certainty that the goods will reach the customer in the same condition that it left the factory.

When I got mine home I examined it very carefully and I'm pleased to say that it was faultless. Can I really be the only one who elicits such great pleasure from extracting a new model from its box? Like Jon's Bell 407, my 212 came in the expected ARTF format with all the difficult and time consuming construction done in the factory. In fact, although not completely finished, it was flying within three or four days from collection and full completion, ready for the photographer, took just a few more days.



The Roban tail rotor assembly, which is common across their range of models, is more than adequate for its job and reflects current technology. I did find an improvement in yaw control by fitting these larger 115 mm tail blades. I like a firm but gentle response, with plenty in reserve if needed



The main rotor-head is far less chunky in design than I've seen elsewhere and whilst Roban have made no effort to dress it up with scale detail, it looks perfect in the air. Being flybarless it has just two pushrods between it and the swash-plate. Teeter damping is quite stiff but this is a weighty machine and it gives a consistent and comfortable control response at all speeds



Lifting the fuselage top fairing (dogbox) from its locating pegs and magnetic catches is a tool free exercise. When it is rotated 90 degrees, clear visual access is available to all the electronics and main chassis mechanics, with plenty of room for servo or stabiliser adjustments



When the dogbox is opened there is also good access at the front for post-flight temperature checks of the motor and ESC

Mechanics Overview

The mechanics come out of their box ready pre-built in just four sections, comprising of the main centre mechanics, the tail boom and intermediate 40 degree tail box, the boom kick-up section with the 90 degree tail rotor gearbox and, lastly, the main rotor-head. Most of the well-illustrated construction manual is largely unnecessary for building purposes, such is the level of prefabrication, but I guess it would come in handy should repairs or rebuilds be necessary.

It does advise in an early section that the bolts on one side frame are not secured with thread-locker. This, they say, is because the frames need to be split to enable the motor to be installed. I'm puzzled by this instruction because I was easily able to fit my motor without any de-construction. However, I did remove and apply thread-locker to each and every untreated bolt. I also applied moderate anti-clockwise pressure to the other bolts but found they were all okay.

I particularly like the design of the transmission primary drive because the motor can be firmly bolted onto its sliding mount and the mount can then be easily and infinitely adjusted with two lead screws to give perfect drive belt adjustment first time – I just love simplicity. I assembled the complete mechanics, boom sections and gearboxes outside of the fuselage to check that all was as it should be. I was pleased to find that all the gear meshes and tolerances were spot on and there was very little friction throughout this relatively complex transmission system.

Compared to my Hughes 500E, which had an earlier version of these mechanics, I noted that the tail ratio was slightly up and

the bevel gears (front and back) were more tightly meshed but without the expected extra drag. As delivered my 500 transmission was initially very noisy but these 212 mechanics were quiet right from new.

Another improvement noted was that the main frames are now made from substantially thick carbon fibre rather than the thinner and cheaper composite frames of the previous versions. These new frames probably add a few grams to the overall weight but certainly not a significant amount. The structure is stiff enough not to warrant any additional upper mounting points, relying purely on its four foot mounts.

The all-metal 90 degree, open tail box/rotor with its tighter mesh is pretty much perfect. It is tube driven with splined connections, to which I always add a small dab of grease, although the manual doesn't ask for it. I was surprised that the bevel gears had a liberal application of grease but the splines were dry.

The intermediate tail gearbox shouldn't go without mention of its simple but superb design. It has very few parts, the casing being precisely moulded in two halves, with two 'petal' bevel gears (also with splined connections) and four ball races. An intermediate 40 degree bellcrank fitted with two control balls bolts onto one side of the



This shot shows the 'set' that I had to put into the elevator servo pushrod, to enable me to obtain the greater negative collective pitch range that I prefer



The tail boom recesses, which are used to mount the tailplane halves, after I had ground out the paint to give a good glue joint



Roban provide a full complement of seats, reflecting its passenger carrying (rather than search and rescue) guise. These are all fixed permanently in place but the rear set is fixed to the battery hatch and comes out with it

case to connect the two sections of the tail pushrod, which, with its liberal number of supports, gives friction free movement from one mechanical stop to the other.

Moving onto the main rotor-head, this sits atop of a relatively long main-shaft (as per full size) and has just two, quite substantial, pitch rods between it and the swash-plate. The all metal swash-plate is kept in phase by a chunky looking driver that's clamped onto the 12 mm main-shaft. This is a flybarless rotor system so no other pushrods, flybar mixer arms or washout mixer arms are necessary – I just love simplicity.

The rotor-head itself is an all metal affair, of conventional design, and is well up to purpose without looking too 'chunky', as would be the case if it were to be moulded in plastic. It's a good fit on the main-shaft with a 4 mm head bolt and, for added security, the lower section of the hub is split, with two clamping bolts to ensure that in operation there is absolutely no movement between the rotor hub and main-shaft.

Avionics And Electrics

Before a start can be made on the fuselage it's necessary to fit the control and power systems and, but for one item, this was a simple bolt/screw on job in the provided places. My philosophy with avionics is to get by with the least number of components that I can. There are two ways of looking at the job. One is with duplication of as many components as is practical, which allows for redundancy in the event of a failure. But, in my opinion, this can create a bit of a rat's nest. However, I take the view that by reducing the complexity of an installation you must reduce the potential for failure. This is just a personal view but my advice to others is, work it out for yourself and then go your own way.

So, I installed three Align DS615 servos



Battery access for my installation is via the left/hand sliding passenger door and the twin OptiPower 6S packs sit in an underfloor cavity in the passenger cabin. Pre-flight, both packs are connected to a Y-lead and then pushed right to the front of the cavity to obtain the correct Centre of Gravity. Then a flexy-foam block (that I concocted) is pushed into the remaining space to keep the batteries in place. To finish, the cabin floor is clipped in place. This securely retains the battery packs and leaves the cabin free of any battery clutter, apart from the ESC to battery connections

for the cyclics and a DS655 for the tail, a Spektrum 7210BX stabiliser with a satellite Rx and, finally, a Castle Creations Talon 120 (BEC) ESC driving a 500 KV E-Flite 700 Heli Motor – I just love simplicity. The servo installation is easily accomplished and correct control movements can be achieved by using the provided set of three metal servo discs.

To get full and free movement of the cyclic servos I had to put a small bend in the elevator pushrod to avoid contact with the elevator control yoke. I always expand the collective pitch range to about 16 degrees to allow for autorotation but without this it may not have been necessary to modify the rod. The provided position of the receiver tray placed the receiver between the carbon frames and, mindful of the fact that this may create some signal blanking, I extended the tray rearwards to place the receiver comfortably outside of the frames.

The last item to be fitted was the Talon 120 ESC and whilst there was no advised position for this, with the minimal length of the motor/ESC connections available, there was only one convenient position for it. Unfortunately, this placed it between the GRP fuselage roof skin and the cabin roof wooden former, where there is little potential for movement of air for cooling. My first thought was to bolt on a Castle cooling fan assembly but unfortunately there just isn't room for this. So I bolted the ESC to a large piece of 3 mm aluminium sheet to act as a heat-sink, which I then bolted to the ply roof former. This has proved to be more than adequate and the Talon has always remained relatively cool.

The one remaining item to be fitted is the tail servo and its associated linkage. There is plenty of room for error here to get a less than perfect set-up but I spent as much time as was necessary on adjusting the positions of all the pushrod guides and the angle of

the servo mount to achieve full and free movement. Experience has shown that zero friction is essential for good tail control. I should also say here that all the control balls and links had a slop/friction free fit.

Fuselage Overview

The beautifully painted fuselage is presented in five parts, comprising of the main centre section, the detachable boom section, the doghouse and the two halves of the horizontal stabiliser. Not only is all the internal woodwork structure pre-installed, it also comes pre-painted and all to a very high standard, with no corrective re-working necessary. The first task is to bolt on the pre-painted, one-piece undercarriage and a minor problem here was that I couldn't find four screws of the appropriate size anywhere in the fastener bags. However, there were four slightly larger screws therein, seemingly without a home to go to, so I used those.

Next, I bolted the main section of the mechanics into the fuselage, complete with the main boom section and 40 degree intermediate gearbox. The short kick-up boom section and 90 degree gearbox section must be left off at this point while the fuselage tail boom moulding is manoeuvred into position and secured with six screws. Then the rear gearbox assembly can be installed and permanently clamped in position through the large removable hatch at the rear, right-hand side of the boom moulding – or so it should.

When I got to this stage I looked down the aperture at the top of the fin and could see some misalignment between the hard foam support for the kick-up section of the boom and the 40 degree gearbox. By trying various shim thickness's placed under the front mounting points of the mechanics I settled on a large diameter 1 mm thick washer under each side and found this gave me perfect alignment.

After connecting the short end of the tail pushrod to the intermediate bellcrank and checking that I still had full and free movement, I screwed the hatch cover in place and gave my attention to the horizontal tailplane.

The instructions simply said, 'Glue them in place!' There is a deep socket for either side but no tubular cross support between them, so I could see that any glue joint would easily fail if I simply followed that route. So, I ground away the paint in the sockets and the mating inner ends of the tailplane halves and then glued them in place with UHU Acrylit (which used to be branded Stabilit Express) with an accurate temporary support until

the joints were dry. When dry, the joint was very rigid and I've never seen the slightest tremor on spool up or down, which is where one would expect to see it if any imbalance was present. With these components glued together by one epoxy moulding face to another rather than the painted faces, the joint is bound to be far more secure.

The final major part of the fuselage assembly is to remove the rotor-head so that the doghouse can be fitted; a simple task since all the mounting guides and securing magnets are factory fitted.

Refitting the rotor-head means that the doghouse can't be removed without taking the rotor-head off again but because of the

long main-shaft length it can be lifted off its magnets and slewed through 90 degrees to give full access to all avionics.

At this point, before I added the final (provided) internal and external scale detail, I thought it prudent to programme the Talon and BeastX and go for a test flight. I find both items relatively easy to programme, partly because their programming is fairly intuitive, but mostly because I've had Andy Brooks on hand to help me in the past. For anyone who doesn't have a techy friend to lean on my advice would be to find one, or do a search on YouTube, which can be very helpful.

In the next issue, Martin completes the Bell 212 and takes it for its test flights. **RCMW**



In the next issue, Martin completes the Bell 212 and takes it for its test flights



Martin casts his eyes over his new scale helicopter after an early test flight

MODEL WORLD

MODEL INFORMATION

NAME:	Bell 212
MANUFACTURER:	Roban
DISTRIBUTOR:	Quick UK
WEBSITE:	www.quickuk.eu/cat/roban_scale_helicopters.html
PRICE:	£1399.94
MODEL TYPE:	Scale helicopter
PARTS SUPPLIED:	Mechanics and scale body
PARTS REQUIRED:	Radio system, brushless motor, servos and flybarless controller

MODEL SPECIFICATIONS

ROTOR DIAMETER:	765 mm
LENGTH:	1940 mm
WIDTH:	355 mm
HEIGHT:	510 mm
POWER REQUIREMENTS:	500 KV motor (750 MX or similar) and 120 HV ESC

DISLIKES

What's not to like?

LIKES

High quality • Comprehensive prefabrication
Realistic performance and appearance



Happy Birthday, Cirencester!

Chris Bowler joins in the 70th Anniversary celebrations of the Cirencester and District MAC

Olive Harris with daughter Caroline and granddaughter Victoria holding one of Stan's still airworthy models, with Cirencester Club Chairman, Patrick Puffett (right) and Chedworth Chairman, Chris Bowler (Pic: Len Gardiner)

Cirencester and District Model Aircraft Club celebrated a milestone in May on the 70th anniversary of its formation. The event took place at the club's home base at Cotswold Airport, the former No 5 MU, RAF Kemble, and home of the Red Arrows before their move North.

Double Date

The birthday celebrations formed part of a double event as the Stan Harris/Alan Dew Memorial event took place at the same time. This was in memory of two stalwart members of both the Cirencester and Chedworth Clubs, who were both avid modellers and great supporters of model aviation. It was decided that an event should be held in their honour, hosted alternately by each club.

The first, last year, was at Chedworth and it was a great success, as was the Cirencester event this year. The weather caused problems, with a heavy downpour in the morning and continuous high winds that prevented much flying. However, the social opportunity was not missed and much chatting, reminiscing and the great interaction between both members of both clubs made for an enjoyable joint meeting with a difference.

Highlight

Adding to the success of the day was a visit by Stan's widow, Olive with her daughter, Caroline and grand-daughter, Victoria who enjoyed their visit even more when one of Stan's models was shown to them. It is still a regular flyer at Chedworth.

Cirencester Club Chairman, Patrick Puffett cut a celebratory cake that was much enjoyed by all.

This was an event when flying was curtailed but nevertheless it emphasised the camaraderie of like minded enthusiasts and celebrated the lives of two fondly remembered 'Gentlemen of Model Aviation'.

All being well the event will be at Chedworth Club next year. **RCMW**



Len Gardiner readies his electric Messerschmitt Me 262



The Me 262 makes a perfect landing, sans starboard tyre that 'let go' on take-off. No damage



The windsock gives an idea of the wind strength – but not the gusts!



This Tri-Pacer was certainly going nowhere, being safely tethered in the static display



A low pass from Pat Puffett's Hangar 9 Sbach, flown by son Mark



Girencester Chairman, Patrick Puffett cuts the birthday cake to celebrate 70 years of the club having being formed



A fine body of men gathered to remember Alan Dew and Stan Harris

Pick Your Own Plan

Get a great deal on your next Traplet plan building project with our new bi-monthly reader offer

Welcome to our third 'Pick Your Own Plan' feature, a very special offer based on selected plans from the Traplet Plans Service, which we will be running when there is no pull-out plan in the magazine.

How It Works

For each PYOP feature the editorial team will hand pick four plans from the Traplet Plans Service (which now includes plans from the MyHobbyStore range, including plans originally published in magazines such

as RCM&E and Radio Modeller). Three of the plans will come from the established categories on the Traplet Shop website, such as Scale Plans, Electric Sports Plans, Powered Sport Plans etc. And the fourth will be a 'lucky dip' taken from a random fourth category.

The offer of 50% off is based on the full RRP as shown on trapletshop.com and to make it even more appealing we are going to start the ball rolling by allowing you to combine more than one offer featured in any one 'PYOP' feature. So if all four aeroplanes

featured appeal to you as potential building projects then you could save up to a whopping £42.50! That's right – almost £43 in potential savings, which you could then spend on a laser cut wood pack or cowl and canopy for one of your chosen models!

Are you ready to clear your building board? OK, here we go...

Pick Your Own Plan - Please quote offer code **PYOP402** when placing your order

"A great project for Cold War aircraft enthusiasts"

Avro Vulcan B2

Graham Dorschell has designed this 68" span Cold War V-bomber for up to 7-function R/C and twin 540 Watt brushless pusher motors. Drawn in detail on the large 2 plan sheets to 1/18th scale, construction is all wood and weighs around 5 kg. Not for beginners.

Designer: Graham Dorschell
Wingspan: 68" / 1727 mm
Radio Functions: 4+
Scale: 1:16.5

Matching items include:
ABS & PETA Set (CA3397SET)
Laser Cut Wood Pack (WP3397)



Order Code: MW3397 **RRP:** £24.50

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"A superb beginner build!"

Cessna 120

This 1:6.45 scale, 1575 mm (62") model has been specifically designed for the beginner and is an ideal first scale model build. The 120 is stable and easy to fly, yet is fully aerobatic. The model is of conventional all-wood construction.

Designer: Brian Taylor
Wingspan: 62" / 1575 mm
Length: 36" / 915 mm

Matching items include:
Laser Cut Wood Pack (WP3346)
PETG Canopy (CA3346CY)
FG Cowl (CF3346CL)
Plan, Wood Pack And Parts Set (SET3346)



Order Code: MW3346 **RRP:** £20.50

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The Store For The Model Builder

“Great for gliding enthusiasts!”

Watts Up

This successful 100 inch Class competition/ sport glider designed by Brian Austin and Ray Pavely uses the MH32 wing section and is ideal for those who like the idea of optional extendable wing panels, and makes a great electric thermal searcher for the sports flyer. Construction is mainly wood with some carbon parts shown on the large single sheet plan.

Wingspan: 100" / 2.54 m

Designer: Brian Austin

Radio Functions: 4

Matching items include:

Laser Cut Wood Pack (WP3398)

Plan and Wood Pack Set (SET3398)



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Order Code: MW3398 **RRP:** £17.50

Please quote 'Pick Your Own Plan' offer code PYOP402 to receive your PYOP discount of **50%** off the RRP plan price. Tel: +44 (0)1684 588599 Website: www.trapletshop.com

“A fantastic scale project from renowned designer Brian Taylor”

Hawker Hurricane Mk.1

This 1:6.8 scale, 1.78m wingspan plan of the Hawker Hurricane is designed on two detailed plan sheets, showing provision for the installation of retractable undercarriage and working flaps. The model is of conventional all-wood construction, but a moulded plastic cockpit canopy, engine cowling and a metal propeller spinner are available. A laser-cut wood-pack is also available.

Designer: Brian Taylor

Radio Functions: 6

Wingspan: 70" / 1780 mm

Scale: 1:6.8

Power: .75 - .80 cu. in. 4-stroke or .60 cu. in. 2-stroke

Matching items include:

PETG Canopy (CA3333CY)

FG Cowl (CF3333CL)

Aluminium Spinner Set (CS3333SET)

Laser Cut Wood Pack (WP3333)



TRAPLETSHOP.COM
The Store For The Model Builder

Order Code: MW3333 **RRP:** £22.50

Please quote 'Pick Your Own Plan' offer code PYOP402 to receive your PYOP discount of **50%** off the RRP plan price. Tel: +44 (0)1684 588599 Website: www.trapletshop.com



Model Aircraft Builder

For those of you who are on Facebook, why not 'like' our new page dedicated to scratch building?

We've been working hard to create a one-stop location where you can discuss building and flying your models, as well as pick up hints and tips. As well as this, our fans have regular conversations about their favourite planes, both models and full size.

You can find it by searching for Model Aircraft Builder or visiting:

www.facebook.com/modelaircraftbuilder

T&C: This offer (PYOP402) ends on 20/07/2017 and cannot be used in conjunction with any other offer.

Capiche 52

We originally reviewed Weston UK's agile aerobat in the May and June issues of 2015 but it was one of those reviews that didn't quite go as planned... A radio problem during one of the early test flights prevented us from exploring the 3D capabilities of the Capiche but recently we received this feature from acclaimed aerobatic pilot Mike Williams, which ties up the loose ends quite nicely



The Capiche 52 has earned a place in Mike's car every time he visits the flying field

Weston UK are a well established model shop, manufacturer and distributor based in Sittingbourne, Kent. Over the years they have supplied very good quality aircraft ranging from the Magnum and Tigersharks, to the very popular Hype and Cougar, to name but a few. A family run business, who are very friendly and helpful, Alan and June run a very successful outlet, which is also home to the famous West engines, pipes and manifolds designed by Alan. In fact any bespoke exhausts can be made by Weston UK.

Weston also stock the famous Malcolm Corbin designed Capiche and it was a pleasure to review the 52 size kit.

The Capiche is a very well known aerobatic model and it is well respected within the freestyle aerobatic community. I have won many competitions with the 140 size and I have flown the 52 size at shows.

The Capiche is a very forgiving and stable model so club flyers can also enjoy flying one. It is reasonably priced and it comes with IC or electric mount conversions, which makes it a very versatile model to suit all needs. Weston UK also stock the motor set ups for either IC or electric power, which can be purchased as package deals.

So with the Capiche 52 unpacked it was time to get started...

First Impressions

After unwrapping the outer packaging I was presented with a well illustrated box which shows a few pictures of the Capiche 52 in various different flight angles. There are also pictures of the IC West set up and the electric set up. When opening the box you are presented with a well packed airframe, which is designed to withstand courier delivery. Once unwrapped you can see that the quality of the Capiche is very good. As with a lot of ARTF models the covering was slightly slack in places due to temperature changes in transit but it was soon re-tightened.

The accessory pack is full of the goodies required to complete the installation and there is lots of pull-pull wire as Weston not only use this set up on the rudder but the elevator as well. This is well proven and gives very good geometry when set correctly.

With the Capiche unpacked I opened the West 52 for inspection, as well as the tuned pipe. This was the usual Weston quality, with the pipe being polished to a high finish.

The instruction manual is well written as a step-by-step guide. It stands out due to its very clear illustrations.

So, with everything ready to go, and some glue products also supplied by Weston UK, it was time to get building.

The Build

Building the Capiche 52 is a very easy task due to the build quality of the kit. The first task was to study the instruction manual, which explains each step in detail.

The wing assembly starts with hinging the ailerons. Once slotted together with the hinges supplied, a small soaking of thin cyano is all that is needed. This is the same for the elevators and rudder.



Even at half throttle the West 52 has plenty of power and the model is airborne after just a few feet

Next, the tailplane is inserted and glued into the fuselage. After cutting away the excess covering and trial fitting the tailplane, the accurate build meant that it lined up square and no adjustment was needed. Do take some time to get the tailplane centralised as if not the elevators will be out of position and they may hit the fuselage due to their size and close proximity. I chose to use the supplied links and control rods as these are of good quality. Weston have made sure that all the hardware supplied is up to the job and this includes the undercarriage, which is a traditional bolt-on affair.

The servos for the elevator and rudder are fitted next. I am using Hitec HS 5625 metal geared units for the control surfaces and a Hitec HS 311 for the throttle. With the servos mounted in the pre-installed bays it was time to get the closed loop set up underway.

The rudder is fine but I remained sceptical regarding the elevator. But with the pre-installed guide tubes this is very easy to set up and the geometry is good. It took me forty five minutes to complete the set up despite, at first impressions, it looking like a bigger job.

The West 52 is quickly set up on the firewall as the captive nuts are pre-installed. It is worth noting that as well as having the ability to fit out the electric version there is also scope for other IC engine installations. With the 52 fitted the West tuned pipe fits snugly into the fuselage and it is also hidden inside the cowling. This keeps everything nice and neat. With the cowling cut out for cooling and access, installation of the tank and the receiver finalised the build.

The wings are traditional bolt-on panels with a tube spar. Access is through the top of the hatch, which makes wing attachment



A small tuck to the undercarriage in knife-edge was cured with a two percent mix of up elevator

and maintenance easy without having to turn the model over. With the battery and switch installed, I set the C of G as per the instructions at 145 mm back from the leading edge. The control movements I set to my own preferences but there is a guided set-up sequence if needed.

Flying

With the Capiche finished it was time to head to the patch.

Starting the West 52 is an easy process and once primed it can be flick-started with ease, but a starter can be used if preferred. I chose to use an APC 12.25 x 3.75 prop due

to its performance for freestyle and also the spool up efficiency for 3D flying. One final check of the engine tuning and all was good.

With the Capiche 52 lined up on the runway, it was time to fly. The model was airborne within 10 feet, with only half throttle applied. It then climbed away with ease at full throttle, proving from the start that the West 52 has more than enough power. A quick trimming circuit saw two clicks of right aileron, then the Capiche was tracking straight. Now let's see what it can do...

The stall is very stable and on 3D rates it will drop into a harrier style flat descent. But on lower rates and with full up elevator

applied it will drop a wing slightly and then recover, so be careful not to drop the airspeed too low. Smooth aerobatics are superb, but I did find a small tuck to the undercarriage in knife-edge, so a small mix of up elevator was applied at two percent.

By the second flight it was tracking perfectly. Rolling circles and loops were axial and it really does groove well. It gives you a feeling of flying a larger model due to its locked in characteristics. Slow rolls and one roll circuits are the same, but even a simple Cuban eight and stall turn is a pleasure.

With the 3D rates set the Capiche really comes alive. Blenders flatten out really

well and the West 52 copes well with the gyroscopic forces from 3D flight. Rolling harriers are axial but as with all two-stroke powered 3D models, you have to work the throttle a little more due to the lower torque.

Rolling harrier loops, harriers and inverted harriers are superb, but in the prop hang the Capiche 52 is a little twitchy on the rudder and elevator, and is more stable in the torque roll with the nose completely vertical. This is how I chose to execute this manoeuvre with very light winds but with a breeze you can hold the nose slightly forward and hang into the wind.

With the fuel running low it was time to land. The Capiche lands like a trainer and is very stable.

Conclusion

Capiche 52 is a great out and out freestyle model, but it can also be used as an intermediate aerobatic trainer to progress your flying with. Combined with the West 52, it is a very good combo. I have had 12 flights now and it has fared very well. In fact it is now a plane that I take with me to the patch every time I visit!

RCMW



Inverted? No problem!



Chequered undersides offer easy orientation during the wildest of aeros



Engine off after another fun filled flight

MODEL WORLD

MODEL INFORMATION

NAME:	Capiche 52
SUPPLIER:	Weston UK
WEBSITE:	westonuk.co.uk/ westonuk2_248.htm
MODEL TYPE:	High performance freestyle aerobatics and 3D
PRICE:	£239.99 – Kit only £419.99 – With West 52T2 engine and Genesis mini-pipe
ENGINE	
RECOMMENDED:	West Eurotech 52T2 and Genesis pipe
RADIO REQUIRED:	5 channel minimum
CONSTRUCTION:	Built up balsa and ply

R/C FUNCTIONS

1. Throttle
2. Ailerons (2 servos)
3. Elevator
4. Rudder

SPECIFICATION

WINGSPAN:	1575 mm
LENGTH:	1650 mm
FLYING WEIGHT:	2.8 kg



GT PD606



GT C607D



Duo 607



GT 3B6-D

Battery Chargers

Part No.	Watts Output	LiPo	Ni-Cd/ Ni-Mh	Lead Acid	Input	Charge Amps	Discharge Amps	Balance Load Per Cell	Price
GT PD606*	50W	1-6	—	—	10-18VDC 100-240VAC	0.1-6A	TBA	300mAh	£35.99 NEW
GT C607D	80W	1-6	1-15	2-20V	11-18VDC 100-240VAC	0.1-7A	0.1A-1A	300mAh	£39.99
Low Price GT Duo 607	160W (2x 80W)	1-6	1-18	2-20V	11-18VDC	0.1-7A	0.1A-1A	300mAh	£29.99
GT 3B6-D	160W (3x 60W)	1-6	1-15	2-20V	11-18VDC 220-240VAC	0.1-6A	0.1A-1A	300mAh	£99.99
GT Duo 612	400W (2x 200W)	1-6	1-18	2-20V	11-18VDC	0.1-7A	0.1A-1A	200mAh	£99.99
GT X-Drive 607	320W (4x 80W)	1-6	1-15	2-20V	10-18VDC	0.1-7A	0.1A-1A	300mAh	£99.99
GT X4 Pro Quad	400W (4x 100W)	1-6	1-15	2-20V	10-18VDC 100-240VAC	0.1-7A	0.1A-1A	300mAh	£149.99
GT X4 DJI P3P4	100W (4x 25W)	4x Output 17.3V, 5A Plus Tx charge O/P and 2x 2.3A USB O/P			100-240VAC	5A	Upto 0.65A	DJI Phantom 3 and P4 Batteries	£149.99 NEW
E-Flite Celecra 4 Way 1S	4x 1S	1	N/A	N/A	Internal Batteries or PSU	4x1S@ 300mA	N/A	N/A	£28.49 NEW

* = Can charge 6x1S or 3x2S or 2x3S or 1x4S+1x2S or 1x6S LiPo batteries



GT Duo 612



GT X-Drive 607



GT X4 Pro Quad



GT X4 DJI P3P4

GT Power X4 ProQuad Charger (4x100W)

Clear 2 Line Backlit LCD Display

User Set Maximum Capacity and Time Limits

Charges

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- Li-Po: 1 - 6S
- Li-Fe: 1 - 6S
- Li-HV: 1 - 6S
- Ni-Cad: 1 - 15 Cells
- Ni-MH : 1 - 15 Cells
- PB/Lead Acid : 1 - 10 Cells

4x Independent 100W Charging Ports (400W Total)

Upto 7A Charge/100W per O/P
Upto 1A Discharge/5W per O/P

4x JST-XH balance Ports

4x Independent Charging and Monitoring

Small Footprint

Maximum Safety

Integrated Carrying Handle

2x 2.3A USB Ports

Charges Fast Charge Balances Discharges Storage Mode Cycles

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Supplied With 4 Sets of Long Charging and Balancing Leads



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Depron Diary

Anthony Bennett files an update from his foam building blog

My own design free flight Edwardian Flyer design looks like it will work and I now need to see if it can be carried over into a larger R/C model

Hello again. I hope you have had some great times building and flying your Depron models and have thoroughly enjoyed yourselves.

For a change I thought it might be interesting to have a go at building and flying some Depron free flight models, just to see if it was possible and what they would fly like once built.

It has been a very interesting experience and it has thrown up some technical and constructional issues that you just don't get with R/C models.

Weight is even more critical with these lightweight models and Depron has its place. Also, the structural requirements are different as well; F/F models need to be stronger round the nose, wing mounts and tail than your average R/C model aircraft.

So at one of the Old Warden weekends I took six models with me – four rubber powered and two electric powered. And I ended up breaking nearly all of them... Oops!

Edwardian Flier

My own design Edwardian Flyer for electric power never got past the test gliding stage, as I had wing retention issues. But it looks like the wing design is going to work and I now need to see if it can be carried over into a larger R/C model.

The wings were built out of 6 mm Depron sheet and all gaps between the ribs were removed, leaving an open structure ready for covering. I then ran a 3 mm diameter carbon rod down the centre of each spar, recessing

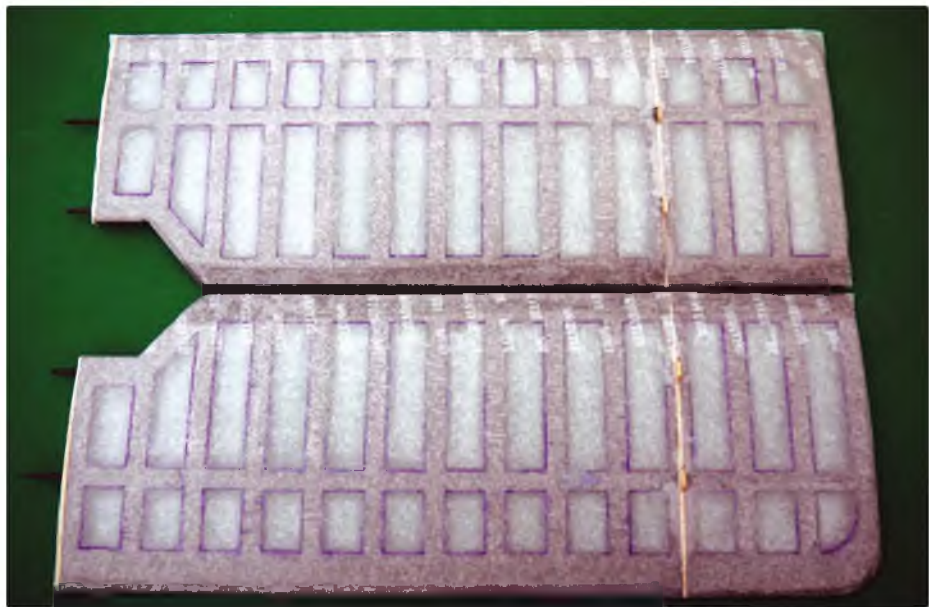
it into the foam and gluing it home with a foaming PU glue.

Once the rods were set, the wing panel was then curved over a rolling pin to get the required undercamber. This was then locked in place by fitting a balsa rib at each end of the wing.

Finally, it was covered with tissue and sealed with PolyC. This makes the wing quite

strong but, more importantly, very light.

I am wondering if it would be possible to use this method to build WW1 biplane wings? I will have to see if the idea can scale up to produce wings of about 48" span. This will be a project that I hope to be able to report on in a future instalment of Depron Diary.



The wings were built out of 6 mm Depron sheet and all gaps between the ribs were removed, leaving an open structure



Right:
My Open Class model flew
okay after lots of trimming

Open Class Model

Rubber powered models throw up their own unique problems, mainly that of foam compression under the pressure of the wound rubber. This means you have to add more balsa to strengthen the inside of the fuselage, from the nose to the peg that holds the end of the rubber in place.

My Open Class model flew okay after lots of trimming, even though the nose got damaged through one to many nose down landings, causing the foam to crumple and bend. It has now been fixed by warming the bent foam and gently pulling it straight; the inside was then lined with some 2.4 mm balsa.

Once the Depron had been glued back onto the balsa the whole assembly was strong and straight again.

I fitted a better prop and a new rubber motor, and can happily report that on a nice calm evening the model flies very well. I need to fit a bigger motor and a larger prop before

I try to go for some duration flights, but that is easy enough to do.

Fairey Fulmar

The electric Fairey Fulmar flew well but was destroyed by a very hard landing (read crash...) snapping the fuselage in three places, so it has been binned.

I am not sure about the best way to strengthen the rear end of the fuselage, so I might have to add some balsa stringers into the construction for the next model. But the problem with doing this is that it adds weight. More tail weight means more nose weight, which means a heavier model and that means the model has to fly faster to counterbalance the weight. So in the event of a crash it will land harder and break more easily – it is a vicious circle.

It might be better to have knock off wings to help dissipate the impact of a hard landing. I will have to ponder more on this issue...



Supermarine Test Model

I have spent today building an inverted gull wing for a free flight version of an R/C model that I want to build at a later date. If I can get it built and flying as a free flight model, I will know that it will work as an R/C model. This will save me time and money in the long run

and will enable me to iron out any design issues quickly and easily before I commit to a bigger more complicated build. This was a quick build model and is a bit rough round the edges, but it was only designed as a test bed for one of my ideas.

It is powered by a KP02 motor set up from

SAMS Models and test glides have been promising so far. So I have a feeling that the larger R/C version will soon be started.

Anyway, that's enough about free flight for now. This is an R/C magazine after all and I really ought to get back to talking about the fuselage construction of my Depron fleet.



This F/F gull wing Supermarine model is powered by a KP02 motor. Test glides have been promising so a larger R/C version will be started soon

Fuselage Findings

On my simple models I tend to construct a box fuselage from 6 mm Depron for the sides and skin the top and bottom with 3 mm.

The formers are mostly cut from 6 mm Depron, apart from the formers needed around the wing and undercarriage mounts; these are generally cut from 6 mm lite-ply.

The motor mount is always cut from 6 mm lite-ply and it also tends to make up the front of the battery box.

Talking of battery boxes, I have started to use a standardised design and I now design the front of the fuselage round the box. This makes life easier as I know the battery will fit straight away, and I also know that I will not have to modify the fuselage at a later date to fit a battery.

I line the insides of the wing openings with 6 mm balsa and pre-drill the wing dowel holes in both pieces before I glue them to the Depron.

If you tape both balsa wing doublers together and then drill the holes through both parts at the same time, they should line up perfectly once the fuselage has been assembled.

Now it is just a case of gluing all the formers to one side of the 6 mm Depron fuselage side and then gluing the other side to this assembly. Make sure you line everything thing up square and pull the tail end in evenly. I run a straight line down my building board and line the fuselage up on this, holding it in place with blocks as I pull the tail in. This way I keep everything square and even – in theory!

At this point I assemble the model and balance the wings. I also put all the servos, ESCs, batteries and motors roughly in place. I can then work out if the C of G is going to be right or if I will have to move parts around to get the model to balance correctly. Quite often I find that the rudder and elevator servos have to be placed down the rear of the fuselage to compensate for the weight of the battery and the motor in the nose.

Once you have decided where all the parts need to go, you can fit the servos and control rods. I have taken to gluing my servos into the model and just line the inside of the cut out with an extra layer of 6 mm Depron to strengthen the area round the hole. The servos are then just glued home with UHU Por glue and left to set.

Now we can finish sheeting the top and bottom of the fuselage with 3 mm Depron. Just lay the fuselage on top of the Depron and draw round the outside, cut the shape out and glue it down and leave to set.

The corners can then be sanded into nice curves and the whole fuselage can be given a light sand with some wet and dry paper (used dry) and then we are ready to cover and paint.

The fin and rudder can be covered off the model and then glued on after the whole model has been covered. The same goes for the tailplane and elevator.

For hinges I now mainly use Mylar and glue them in place with thin CA glue, being careful to not let the glue get onto the foam as it will eat into the surface very quickly.

For covering my small models I now use heavyweight tissue and PolyC sealer. This is water based and does not smell, so the job can be done indoors without upsetting the other residents! Cut the tissue to size and then pre-wet the area you are going to

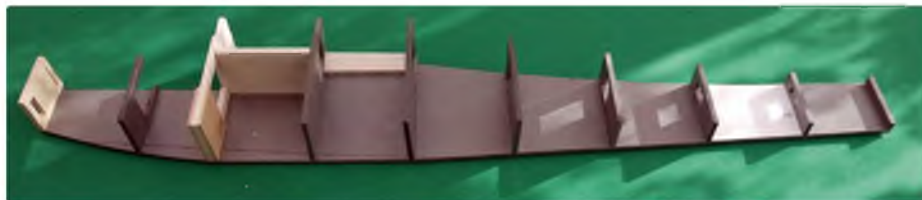
cover with a thin wash of the PolyC. Place the tissue on the wet area and pull to shape. Once happy with the position apply another thin layer of sealer to the surface, making sure you pull the tissue tight. Set to one side to dry; this should take about 30 minutes, depending on the ambient temperature.

Do this to the whole model and once the first coat of sealer has dried you can give the model a second coat to fully seal the surface. Then you just have to apply your paints to the required pattern and once the paint has fully dried apply another two coats of PolyC to seal the paint. For paints I now tend to use household emulsions bought from my

local DIY outlet – they will even mix paints to match exactly the colour you need. Or buy tester pots as they are good value and you will not need that much paint for these smaller models.

You can use iron on films if you are careful, with the iron temperature set suitably low. On my very large models I tend to use brown paper and PVA glue. I will go into more detail at a later date when I build the next model specifically to try iron-on covering methods.

Now it is just a case of the final fit out and setting up ready for that all important first flight.



For simple models I construct a box fuselage from 6 mm Depron and skin the top and bottom with 3 mm foam



Formers are mostly cut from 6 mm Depron, apart from those around the wing and U/C mounts, which are from 6 mm lite-ply. I line the wing openings with 6 mm balsa and pre-drill the wing dowel holes in both pieces before I glue them to the Depron



For covering small models I now use heavyweight tissue and PolyC sealer. This is water based and does not smell, so the job can be done indoors



When painting a model I use household emulsions bought from my local DIY store. Tester pots are an economical way of applying different colours

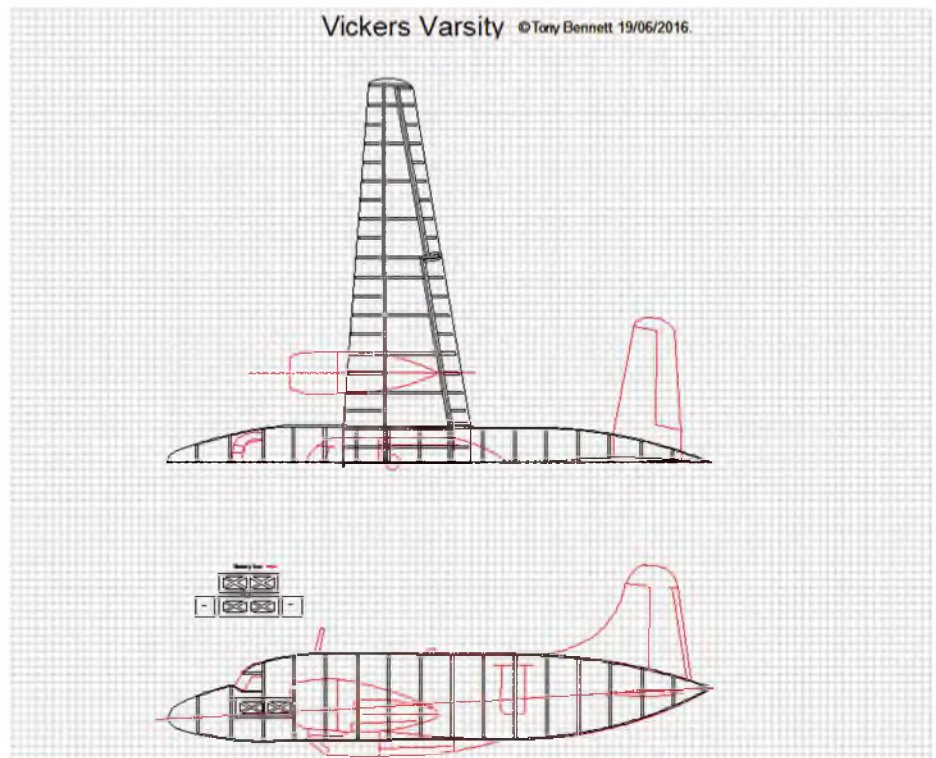
Computer Aided Design

Of course, when designing the model first in CAD we can get everything in the right place before we commit to cutting foam and wood, plus any alterations are easier to do on the computer than on the model. Though there are some issues that just do not show up until you have started to build. These issues have to be sorted on the fly and then the modifications added to the drawings later.

Sometimes a drawing looks great, but when you finally hold the constructed part in your hand it just does not look like it did on paper. So my design work tends to be a combination of the two. I do the rough design on the PC and then print off the parts and start constructing the model.

That way I can alter things that are not right and then change the plan on the pc as the build progresses, until after many happy hours of building and drawing I end up with a nice model and a completed plan.

I will go into more detail of how I draw up my plans in the next instalment.



One of my CAD drawings



Dave Willson of Concorde MFC has sent in some pictures of his foam board Spitfire



Dave's model is constructed from 6 mm foam board, which can be folded to form the wing

Reader's Model

Dave Willson of Concorde MFC has sent in a nice picture of his foam board constructed Spitfire.

The model is constructed from 6 mm foam board. It has a wingspan of 60 inches and weighs 3 lb. It is powered by a 3551 900 KV motor, with a 40 amp speed controller and a 4S LiPo turning a 12 x 6 prop. This gives about six minutes of spirited flying.

Foam board is basically Depron covered with a layer of paper on each side. It can be glued together using UHU or hot melt glue from a glue gun. Wings and fuselages look to be a lot simpler to construct using foam board as the following pictures show.

Well that's it for now. I am off down the shed to stick some more Depron together. I hope the weather holds off and that you all can get some good days flying in.

Have fun – I know I shall! **RCMW**

Right: The Spitfire has a wingspan of 60 inches and weighs 3 lb. It is powered by a 900 KV motor, with a 40 A ESC and a 4S LiPo turning a 12 x 6 prop



CONTACTS

If you would like to have one of your Depron models or building tips included in the next article, feel free to write to me at the following Email address, enclosing a good quality picture or two: arden48@gmail.com

Florida Jets

Barry Vaught reports from the annual jet-together in Lakeland, Florida, which signals the start of the US R/C airshow season



Scott Marr's new Elite Aerosports/CARF-Models F-100, built by Trond Hammerstad

While preparing for Florida Jets 2017, I wondered what new adventures awaited participants and observers at Paradise Field, Florida USA. Every Jet-together is always full of new surprises, while generating camaraderie amongst some of the happiest group of international jet aeroplane enthusiasts in the universe. The excitement kept building for months as pilots posted photographs on social media of some of the jets they were preparing for FJ 2017.

Florida Jets is an excellent way for manufacturers and distributors to showcase their new products, and they sure did. There is no official competition in a jet-together, however the unofficial competition between manufacturers is strong and encouraged.

There was a Monster Havoc Invasion at Florida Jets 2017, with four Elite Aerosport Havocs flying in formation on Saturday. And on the last day there were six Havoc jets in formation! There were also Swordfishes, T-1s, T-3s, B2s, SU-27s, F-100s, F-104s, F-16s, Corsairs, Boomerangs, Turbinators, Mirages, Dolphins, L-39s, Fiats, Shockwaves, Diamonds, Hawks, Bandits, Ventrixx and many more.

The giant Havocs were everywhere and to see six in the air at the same time was loud and a thrill. The Havoc pilots were David Shulman, Ali Machinchy, Pablo Fernandez, Joey Tamez, Michael Abraira, and Azza Stephens. David Shulman was sky-writing smiley faces with a Havoc during some of his flights. Superstar pilot Ali Machinchy has been attending Florida Jets since 2002 and he said this was the best one yet.

Dreamworks RC/CARF-Models brought some amazing jets, like the F-100 Super Sabre, SU-27, SU-30 and and the only

operational large scale RC B-2 Spirit 14 foot wingspan flying bomber that exists. The full scale B-2 was remotely controlled by a top secret military computer with no on-board pilot. Watching the RC B-2 Spirit fly was breathtaking and congratulations are due to CARF-Models who designed and adapted the R/C controls to work on this aeroplane. The RC B-2 Spirit was in development for two years and one prototype model was lost during testing. Harry Wolff and Bernd Jaeger started to develop and build this iconic aircraft before CARF-Models got involved and brought it to perfection in flight and on the building table.

Miami's House of Power brought the T-1, T-3, T-33 and the three metre Swordfish Jet that was on offer at a very special show price of \$3,800. Franco Di Mauro and Henry Castellanos were featured in the half time show when they flew their 3D vectored thrust jet in every conceivable manner. They also hovered their jet several feet above the runway while walking beside it. They also flew their T-1 and T-3 jets in close formation whilst shooting smoke trails and making very low passes over the runway.

The first practice day brought some morning crosswinds, but several pilots flew anyway. Franco Di Mauro was flying a T-3 and brought it down unexpectedly, performing a couple of rolls before the final approach. Franco landed his aircraft perfectly while rolling into the cool down slot. All this was deadstick with no turbine power as his fuel tank was empty. He has no fear of this condition and it is a treat to watch him fly.

It is always a pleasure to attend Florida Jets. Frank Tiano produces a great entertaining, thrilling, fun, safe Jet-Together

where pilots can safely burn fuel to their heart's content while never having to look into the sun. I would like to thank all the pilots, builders, Frank Tiano and RC Model World magazine for the opportunity to photograph so many beautiful aeroplanes.

RCMW



House of Power 3D Jet in the hover with Franco Di Mauro and Henry Castellanos



Elite Aerosport's 'Havoc Invasion' six jet formation. Leave it up to Ali Machinchy to help make every R/C airshow that he attends extra special!



Elite Aerosports/Team Havoc: Michael Abraira, Lukey Martinez, David Shulman, Pablo Fernandez, Azza Stephens, Ali Machinchy, Scott Marr, Joshua Tamez and Joey Tamez

CONTACTS

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 facebook.com/barryvaughtphotography

FRANK TIANO
 franktiano.com

Florida Jets 2017 Special Awards

Award	Sponsor	Winner/Aircraft
STATUES:		
Best Scale Jet, Runner-Up	Zap Glue	Rei Gonzalez - MiG 15
Best Scale Jet	KingTech Turbines	Thomas Singer - F-100
Best Sport Jet, Runner-Up	CARF-Models	Azza Stephens - Elite Havoc
Best Sport Jet	Horizon Hobby	Pablo Fernandez - Elite Havoc
Best Sport Jet Performance	Dreamworks RC	David Shulman - Elite Havoc
Best Scale Jet Performance	Model Airplane News	Ali Machinchy - F-104
Electric Jet Performance	House Of Power	Rod Snyder - F-80
Best Multi Jet Performance	Elite Aerosports	Jim Martin - F-14
Best Craftsmanship	BVM Jets	Scott Marr - F-100
Most Outstanding Jet Flight	Jet Central Turbines	Franco Di Mauro - Swordfish
Just Plane Crazy	Cortex-Demon Gyro	Andreas Gietz - B-2
Super Suave Award	Fly Girls	Azza Stephens
PLAQUES:		
Special Recognition	Jet Cat USA	Greg Arnette - Mirage F-1
Special Recognition	Ez Balancer	Jose Melendez - Fiat G-91
Special Recognition	Best In The West Jets	Tim Len - A-4
Special Recognition	PowerBox	Mike Saryz - F-15
Special Recognition	Sport Flyer Magazine	Rob Lynch - F-16
Special Recognition	Spektrum Radio	Rei Gonzalez - F-84F
EAGLES:		
Critics Choice Runner-Up	Horizon Hobby	Thomas Singer - F-100
Critics Choice	Zap Glue & MAN	Andreas Gietz - B-2



Andreas Geitz piloted the Dreamworks RC/CARF-Models B-2 Spirit Bomber. Spanning 14 feet and with twin JetCat P100 turbines this model won the Just Plane Crazy and Critics Choice awards



House of Power's Swordfish flown by Franco Di Mauro. 122 inches long, it won Most Outstanding Jet Flight



House of Power's Franco Di Mauro and Henry Castellanos smoking the runway with their T-1 and T-3. The 103 inch span T-3 debuted at FL Jets with a K310 turbine

Kristopher Gunter's Skymaster F-18D Hornet. 117 inches long, twin KingTech K-180 turbines



Michael Sarysz's Fei Bao F-15, winner of a Special Recognition Award. 73 inch wingspan model is powered by a Mammoth SE turbine

Dana Thrasher's Turbinator of 76 in wingspan, 26 lb, with P140X turbine. Marine Corp colour scheme



Above: Dreamworks RC's new Ventrix jet looking good in the Florida sun



Scott Prossen and his Skymaster Hawk 100, 78 inch wingspan, 40 lb, Futaba 18Z radio



Left: Sam Wright is celebrating over 32 years of announcing at Frank Tiano's R/C airshows. Congratulations Sam and thank you for a great job!



Eduardo and 'Jet Girl' Anna Esteve's new 1/5 scale BVM PnP F-16C. 80 inch wingspan, 46 lb, KingTech 210 turbine, DX-18 radio



Greg Arnette's Mirage F-1 won a Special Recognition Award



Pastor Greg Hames' 1/5 scale Fei Bao F-100. 85 in wingspan, 55 lb, JetCat turbine



Roberto Zelaya's Fei Bao T-33. 108 inch span, KingTech 210 turbine, DX-20 radio



Rei Gonzalez's Fei Bao Hawker Hunter. 120 inches long, 88 in wingspan, Jet Central Cheetah turbine



Jaleigh Melendez's 'Frozen' themed Dolphin letting it go!



Mike Saryz's Ultra Bandit



Todd Witkoff's Diamond from Aviation Design. 98 in span, 38 lb, JetsMunt 200 turbine, DX-18 radio



Scott Marr's Elite Aerosports/CARF-Models F-100 has a Behotec 220 turbine, Tailormade Graphics, UniLights, Dan Gill parachute, missiles and bombs, and a Tailored Pilot. Best Craftsmanship Award



Tailormade Graphics, UniLights, Dan Gill parachute, missiles and bombs, and a Tailored Pilot. Best Craftsmanship Award



'Team BVM' Greg Arnette and Dustin Buesher with their new BVM F-16 PNP



Ali Machinchy's Elite Aerosports Shockwave. KingTech 210 turbine, Spektrum DX-20 transmitter and PowerSafe receiver



Thomas Singer of CARF-Models and Trond Hammerstad of Exact Aircraft AS with two beautiful CARF F-100 Super Sabres



Greg Foushi with his BVM F-16. KingTech 210 turbine, JR 28X radio. Fitted with new wing tanks, bombs and rockets

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Six In A Row (Plus One!)

John Stennard updates us on his latest small EDF builds. And then finds another one!

Typhoon and F-117 built from the Foam Concept Jet plans for size comparison

The loss of my regular 'Small Thrust' EDF feature in the late Q&EFI resulted in a break from the electric jet scene for a while. I now had time to concentrate on flying my existing EDF models rather than building and/or converting new ones for a regular magazine feature. However, I soon found my need for some new thrust had returned, so I looked for some sport foam jet projects rather than off the shelf models. I had a number of different fan units so I was prepared to look at a number of different sizes of model.

While there are free designs for profile foam jets online, I was attracted to the Foam Concept Jet plans from Chris Allen in the USA. These are relatively inexpensive and once downloaded all you have to do is use your printer to enlarge them and 'tile' print. In addition, I was also attracted by the John Rutter Javelin plan that was published in this magazine (MW3767).

Eurofighter Typhoon

Taking a quick look at the models, starting with the Eurofighter Typhoon, both of my versions (and the F-117) used the 30 mm fan units from defunct E-flite jets. These units are also available as a 'spare' part and they use a 2S 300 LiPo; I used the Turnigy version. Other makes of 30 mm EDF units are also available from a number of online sources.

The Typhoon was a standard build using 3 mm Depron. It has a profile fuselage and a flat wing, with two 2.5 g servos operating the elevons.

My enthusiasm then ran away with itself and I ended up building four FCJ models, plus a modified one, and then the Javelin. I'm hoping this feature may inspire you to try a sport foam EDF jet. If you are new to this genre, you have never had it so good as EDF units, ESCs and high performance LiPos are all relatively inexpensive.

My FCJ models started on the small side with a vectored thrust micro Typhoon. Success here led me to another micro jet in the form of the F-117. I liked the Typhoon so much I then built another but without the vectored thrust. Getting bigger, I built the larger MiG 29, which also features a simple form of vectored thrust, and then the X-47.

The tricky bit was always going to be the vectored thrust arrangement. Guided by the online video instructions, I worked on this unit before I built the model and found that it worked well. The unit consists of two separate hinged tailpipes that provide pitch and roll vectored thrust. These are linked to the elevons by CF pushrods. It is important keep the AUW as low as possible by using a small 6 A ESC and micro Rx. With a flying weight of 50 g (1.76 oz) I was not sure what to expect but the VT Typhoon flew well. The effect of the vectored thrust is not huge

The Javelin was the last of the line and I spent an inexpensive and very happy time testing them and having flying fun.

Sport EDF foam modelling is an enjoyable experience and is a low cost build. Some 3 mm and 6 mm Depron, some CF strip and rod, some 6 x 3 mm bass wood or similar is also useful, plus some 3 mm ply. Use UHU POR or whatever takes your fancy glue wise; I tend to use minimal amounts of foam safe CA, with 5-minute epoxy where additional strength is required. Most of these are modelling stock items anyway and you probably have them knocking around the workshop.

As far as the thrust bit goes pay only as much as the model needs. In my case I had a number of suitable fan units and ESCs, and all the R/C gear to hand. So my only costs were for a couple of sheets of high quality Depron foam.

but it is definitely there and it provides some alternative manoeuvres.

I'll move straight on to the second Typhoon, although the F-117 actually came next. I was so pleased with the performance of the VT Typhoon I decided to build another but without the VT. I reckoned that with a straight through tailpipe it would possibly have an even better performance. While this model ended up only a few grams lighter the increased efficiency of the tailpipe gave a faster flight and very good manoeuvrability without the extremes provided by the vectored thrust.



FCJ micro Typhoon does a fast pass

This photo clearly shows the wing construction



A close up of the VT tail-pipe



Micro Typhoon number two climbing away. The straight, non-VT tail-pipe can be seen



An inverted pass shows that micro jets like this perform well

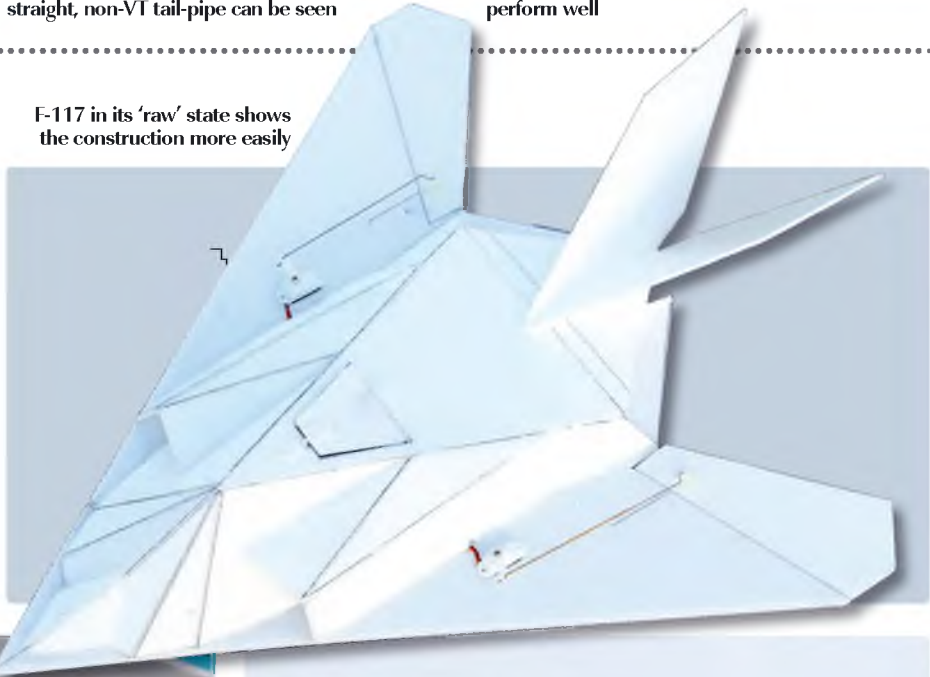
F-117 Nighthawk

The F-117 is clearly a far more complex model to build and even with the video instructions it caused a bit of head scratching at times. In fact, with care the model assembles without any problems, although installing the R/C gear has to be carefully planned. Basically the same type and size EDF unit was used, as was all the same R/C gear.

Again I chose to test fly the F-117 before any paint was applied and I was pleased with the flight performance. I was surprised by the fact that the model flew at all due to the unusual design!

I painted the F-117 with a thin coat of matt black acrylic spray and although orientation was then an issue, unless the model was flown quite close, I enjoyed piloting this unique aircraft.

F-117 in its 'raw' state shows the construction more easily



An underside view shows the EDF position. Stay off the concrete when landing!



The micro F-117 is hard to both orientate and photograph!

MiG 29

Next in the EDF line came the MiG 29 and this model is designed for a 70 mm fan unit and 4S flight pack. This clever design provides a moderate amount of vectored thrust. Apart from a small amount of strengthening, where I used a double layer of 6 mm Depron in the central area, the model was built as designed.

I fitted a 70 mm fan unit that worked fine on a 3S LiPo, as I knew from previous applications that it gave ample power. The vectored thrust is achieved by linking the elevons to combined elevators/tailpipes. After the initial test flights, which were very successful using a 3S 2200 LiPo, I applied some matt acrylic paint using 'tester' pots from B&Q. The simple vectored thrust system gives extremely tight loops and other manoeuvres, while also enabling slow, high alpha flying.

The MiG 29 is an absolute delight to fly and it cost me just the plan and a sheet of 6 mm Depron. It is very satisfying when models built from plan designs perform so well.



The MiG 29 flies beautifully. The clever VT system provides opportunities for some agile manoeuvres



She is equally at home flying inverted and tracks really well



This view shows off the underside and my strengthening with Depron

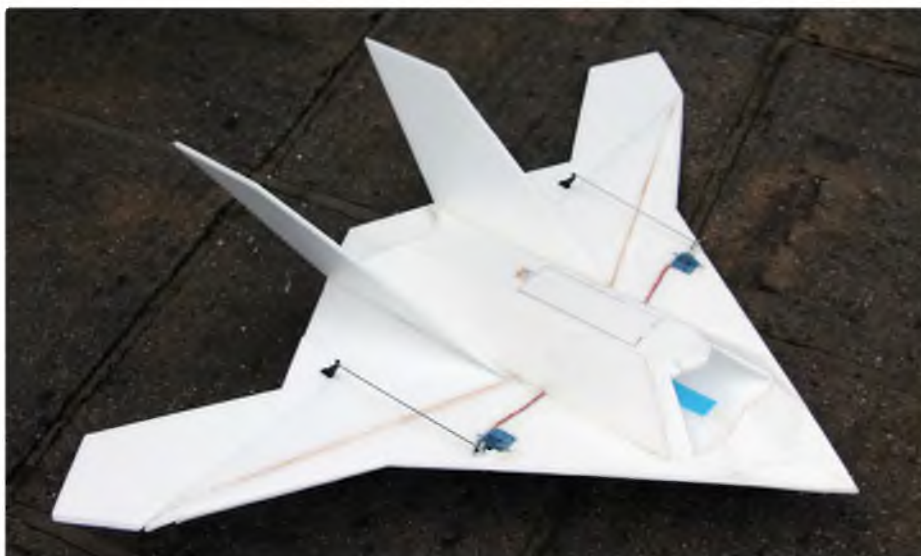
X-47 Drone

Of course the X-47 drone was going to be a bit different, as the only 'unmanned' aircraft in my EDF line up. But it had been modified to have twin fins. I guess in theory, with full stabilisation, it should be possible to make one without fins. This model is again built from 6 mm Depron and designed for a

70 mm fan unit. I had another unit of the type used in the MiG 29 and it required the same size flight pack in order to get the C of G in the correct position. This model required a little more building skill as it is partially 3D but, again, with the help of the online building video, there were no problems.

Due to the unusual planform I was a little

apprehensive at the test flight stage but I need not have worried. Chris had again designed a thoroughly practical model with a really good performance. The X-47 will fly happily over a wide speed range and my thoughts that this futuristic looking model might be tricky to pilot were completely unfounded.



X-47 drone with fins looks very unconventional



Worried? What can go wrong!



The X-47 proved to be a very stable aircraft and easy to fly



Underside view showing the EDF unit and elevon shape

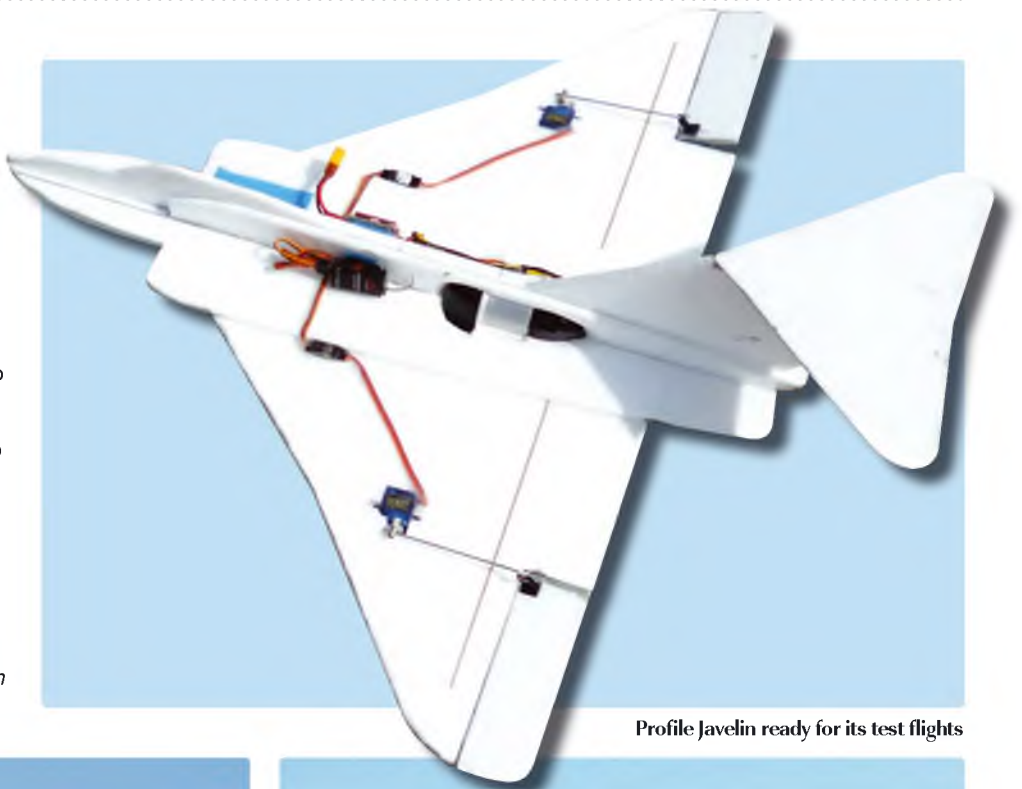
Gloster Javelin

Now for the Javelin. Interestingly, while I clearly remember viewing static Javelins at various Battle of Britain air shows back in the late 50s, I cannot recall seeing one fly. This aircraft was not a resounding success in operation so I did wonder about its performance in model form.

As usual, John Rutter's plans make up into thoroughly practical models and the Javelin was no exception. My model is powered by a 55 mm metal shroud Dr Max Thrust unit; I fitted the 3S version and used a 3S 800 LiPo pack.

My Javelin needs a firm and fast launch, and then performs well, although care has to be taken at slower speeds. It's a good idea to check out the safe slow speed at height so you don't get caught out on the landing approach. Again, another sport scale EDF model that is an interesting build and fun to fly.

(A laser cut Depron pack for the Gloster Javelin is available from the Traplet Shop. Please visit gb.trapletshop.com and search for DP3767)



Profile Javelin ready for its test flights



When completed the Javelin has a very good performance



A blast from the past as the Javelin does a low pass

EDF BUILDS

Chengdu J-10

That was the end of my 'six in a row' foam profile EDF models but then another model just sneaked in, under the radar as it were. I regularly check out Chris Allen's 'Foam Concept Jets' website to see if he has introduced any new designs and recently he has.

One that immediately appealed was a micro jet version of the Chinese J-10 jet. I had built and flown two different versions of the 70 mm fan size J-10 available from Steve Webb Models and both had performed really well. Chris' micro J-10 also appealed as it had an interesting vectored thrust system.

The model has elevons with links from the control horns to 'elevators', which were actually a split tailpipe. This is a case of a picture telling the story. The 'tailpipe elevators' are of course directly in the thrust so are very effective at deflecting the thrust.

This model uses exactly the same gear as all of the other micro jets and it ended up weighing the same as the Typhoon. As with all the other models from Chris the design is spot on and the J-10 flies beautifully. It's not quite as fast as the Typhoon but plenty enough to be interesting.

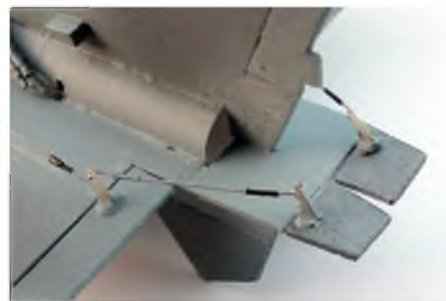
The 'tailpipe elevator thrust vectors' work very well and they produce both very tight rolls and loops. With full control input the loop is more of a tumble and is quite impressive. So, again, for a minimum expenditure on the plan and some 3 mm Depron, I've experienced another enjoyable sport EDF building and flying experience.

Summary

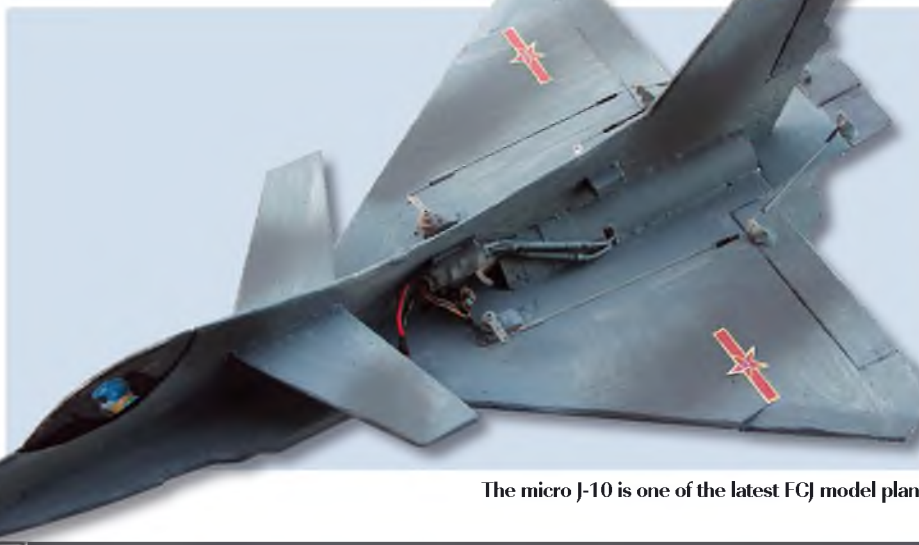
I hope the experiences with my 'six in a row, plus one' profile EDF jets may have encouraged you to try this low cost genre.

Many modellers will have EDF gear removed from defunct models cluttering up the workshop and it really can be put to good use. Even if you were starting from scratch the costs are relatively low due to the ready availability of EDF units and ESCs.

It's also worth remembering that your flight pack LiPos should be considered to be 'consumables' (hopefully not combustibles!) and the latest generation of higher 'C' rating versions are well worth purchasing. This applies to most electric flight applications, but particularly EDF. **RCMW**



This view shows the elevator/tail-pipe VT system



The micro J-10 is one of the latest FCJ model plans

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Here's a couple of examples of what can be achieved with the Fisher Delta

Scale guns for World War I fighters

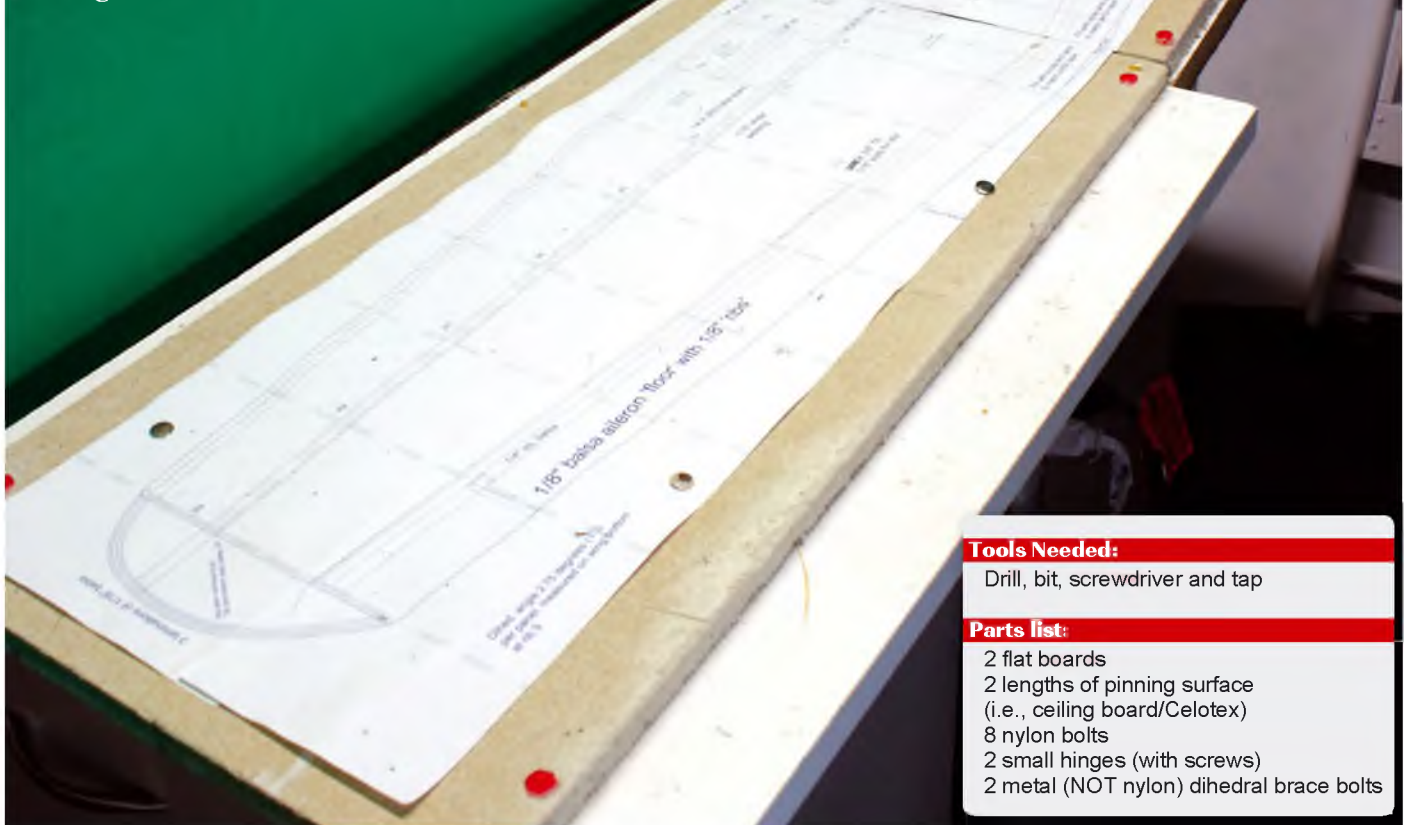


Scale ejection seats for military jets

Full specifications, videos of the printer in action and further information is available at
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Little Wing Jig

Bill Bowne passes on details of a simple to make building board for small models



Tools Needed:

Drill, bit, screwdriver and tap

Parts list:

2 flat boards
2 lengths of pinning surface
(i.e., ceiling board/Celotex)
8 nylon bolts
2 small hinges (with screws)
2 metal (NOT nylon) dihedral brace bolts

Models with straight wings fly better and this simple jig helps make building smaller wings straight and true

Regular RCMW readers may ask: "Does this guy ever build a model without some sort of jig?"

Simply put, the answer is: "No, I don't!"

Straight models fly better, be they of balsa, foam or whatever. And jigs make it much easier to build a straight model. Plus, building a wing in one piece (including the dihedral joint!) eliminates a lot of the finicky sanding/fitting/sanding encountered when combining

two separately constructed wing panels. That usually translates into a lighter, stronger and better performing model.

I've used an Adjusto-jig for well over thirty years and I am very fond of it. But it's too big for smaller models. So, I designed this jig for dihedral wings of under 48" span, preferably with at least a partially flat-bottomed aerofoil.

The jig's heart is two FLAT boards (I used

melamine-coated chipboard), joined with a tiny pair of DIY store hinges. The pinning surface (ceiling tile is good) is bolted to the boards with nylon bolts so that it can be replaced when worn. Fine-tuning the built-in dihedral is accomplished via long bolts, threaded into the elevated panel of the jig.

Build Your Own LWG

Building the Little Wing Jig is pretty easy. Start by drilling and tapping a series of holes in the bottom middle of one board. These will be the holes for the dihedral holding bolts. I prefer two, just in case one slips! Plus, please don't use nylon bolts here as they bend under pressure!

On a flat surface (vital to building a flat jig!), butt the two boards together. Join them with the hinges, being careful to keep the hinge centre-lines directly over the joint between the two boards.

Measure for the pinning surface holes, then drill through them and the boards. Drill and tap for the nylon bolts. Before adding the pinning surfaces, relieve their bottoms to clear the hinges.

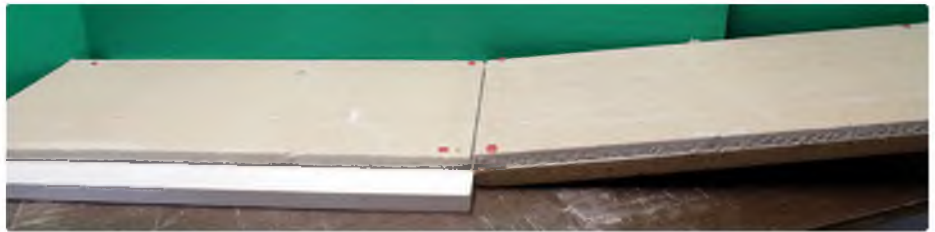
When using the jig, remember that instead of elevating two wingtips EACH by a given amount above your work surface, you're now going to leave one flat on the workbench and elevate the other wingtip TWICE as much. So, if the plans call for one inch of dihedral under each wingtip, leave one wing flat on the table and elevate the other by two inches.

RCMW



The bottom of the jig. Simply twist the bolts to set the dihedral angle. The second bolt is insurance for your work, should the first bolt slip

Right: It's hard to see the dihedral bracing bolts under the board, but they're there!



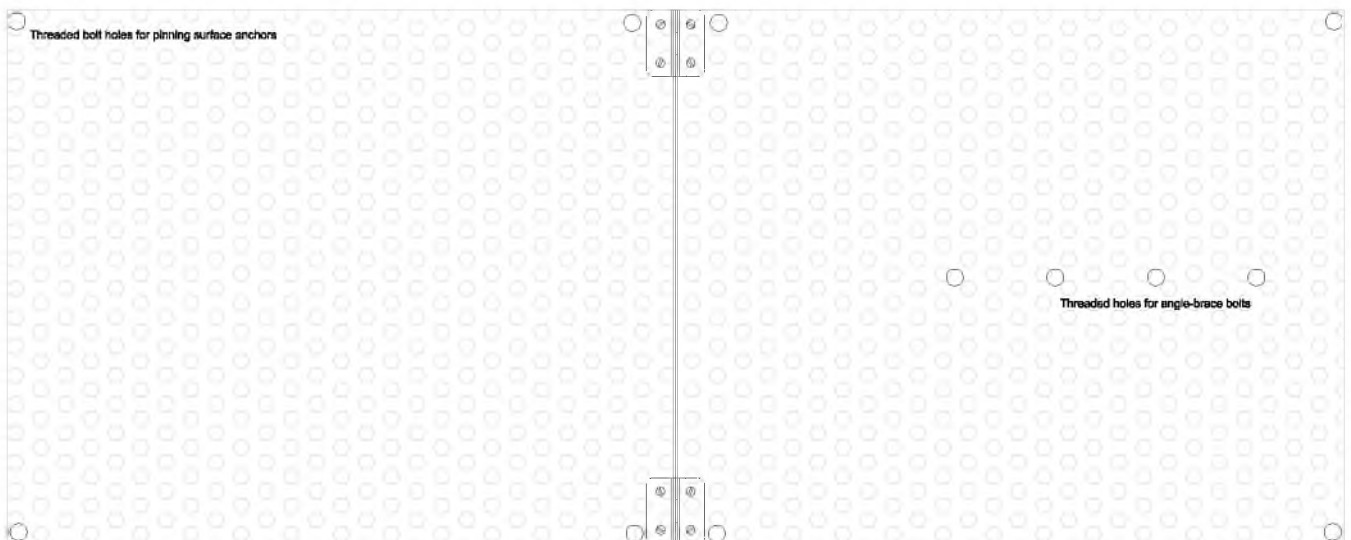
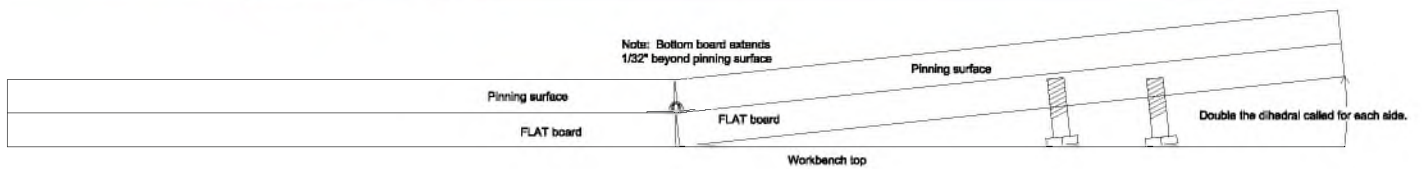
Below: Ceiling board has been removed from the left side of the assembly to show the hinges and the pinning surface bolts (the bolt heads are painted red to make them visible). Space the hinges far enough apart to clear the wing's root chord. Leave about 1/32" underlap of board under each pinning surface



With the plans thumb-tacked to the ceiling board, and plastic sandwich wrap tacked over that, it's time to build a wing!



The LWG was used to build this PT-19, which was a the free pull-out plan in the April 2017 issue of RC Model World: gb.trapletshop.com/airchild-pt-19-set



Flat on table side

Elevated side

National Museum of the USAF

In the first of a two part feature, Bill and Micki Bowne tour a large museum built to protect and display aeroplanes operated by the United States Air Force. There's plenty of inspiration for your next scale model in Micki's photographs shown here!

This Douglas C-133 'Globemaster II' is just one of many huge aircraft on display, with smaller aircraft parked below and suspended from the ceilings

My first visit to the United States Air Force (USAF) Museum, now the 'National Museum of the USAF', was almost fifty years ago. Back then the museum was in an old warehouse, with most of the larger aircraft parked outside. They were exposed to the brutal Ohio sun and looked pretty beaten up.

Since then I've gained a wife (Micki, who took all the photos you see here), a few pounds and some grey hair. Meanwhile, the USAF Museum moved to a new building, then added a large addition, then two more large additions, one of which opened shortly before our visit. All that space was needed because the Museum also gained a large number of new aircraft, plus dedicated staff to restore and care for the collection. Now only a small handful of aircraft are outside in the weather, with another small group in storage. The rest are all indoors, in large hangar structures with soaring ceilings, and protected from the weather.

There are prices to be paid for storing the aeroplanes indoors. Limited space means smaller aircraft are often hidden under the wings of larger aeroplanes. Plus, as the exhibits are grouped by era, some groupings are 'denser' than others. Add in guardrails to keep inquisitive fingers from damaging fragile bits – and to keep eyes from being impaled on pitot tubes! – and some planes are just impossible to capture in one photo.

Lighting, as usual, is another perpetual issue with aircraft museums. The glare from some polished aluminium aircraft made them very

difficult to photograph, yet their camouflaged neighbours were easy... Or would've been easy had their colours been lighter than the black walls and ceilings! We gave up trying to get good photos of the B-2, for example.

Entrance to the museum is free, although getting from the entrance to the exhibits requires walking through the gift shop. That can get very expensive, very quickly!

We recommend devoting a full day to the museum and wearing comfy shoes. Eating is restricted to the two cafés so don't plan to bring any food or beverages into the museum; we found the food to be reasonably priced, anyway. There are toilet facilities in each building.

Obviously, we didn't try to photograph every aeroplane – the collection is so large that Kevin would have to devote an entire issue of RCMW to it! Likewise, we tried to focus on the odder and rarer aircraft (hence no P-51 photos!), nor did we visit the display of US Presidential aircraft (i.e., 'Air Force One').

Having spent two decades in the USAF, going to the museum lets me visit some old 'aluminium friends', high on the list of which is the F-106 Delta Dart, formerly of the 49th Fighter Interceptor Squadron (49th FIS). My first active-duty assignment was at the same base as the 49th FIS, at Griffiss AFB, NY. My job then was Weather Observer and I spent many hours in a large windowed building alongside the runway. One of the 'perks' of that job was watching the 49th's F-106s fly – always a beautiful sight! Another thing about the 49th FIS is that the fin flash was designed by Curt Poorman, who was a ground crew member. Some years later, Curt cross-trained into Weather; he and I worked together and became friends at Elmendorf AFB, Alaska.

Compared to the RAF the history of the USAF is a bit complex and this leads to some odd changes in designations. The RAF was born by the merger of the Royal Flying Corps and the Royal Naval Air Service, and aircraft were given simple names that usually stayed the same for the service of the aircraft.

However, the USAF remained an arm of the US Army (under several different names, such as the Army Air Corps and Army Air Force), until it became a separate service on 15th September, 1947. When that happened most USAF aircraft naming conventions were changed, the two most frequently confusing ones being operational Pursuit ('P') aircraft becoming Fighters ('F'), and the Attack ('A') category being eliminated (although it was later brought back). That's why the P-51 and P-80 became the F-51 and F-80, and why the Douglas A-26 became the B-26 (replacing the retired Martin B-26 Marauder).

That's enough chatting. Let's take a stroll through the National Museum of the USAF. I hope that you enjoy the photos! **RCMW**



Outside, the museum looks like a simple storage silo in front of some hangars. Inside – wow...!



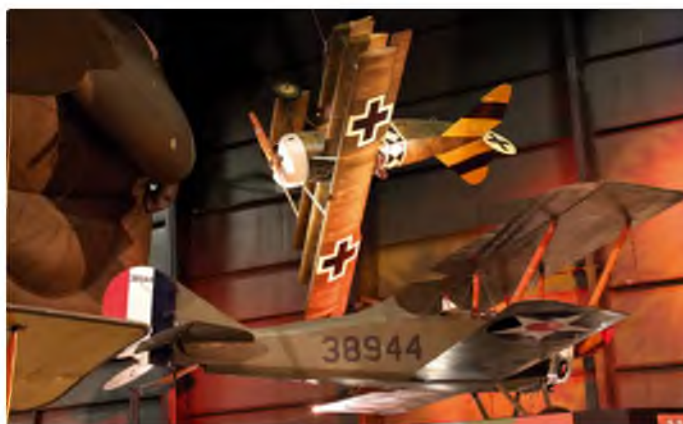
Well, we're in Dayton, Ohio (home of the Wright brothers) and the museum's on the grounds of Wright-Patterson Air Force Base, so of course the first display is a replica of a Wright Flyer!



The Standard J-1 was a contemporary of the better-known Curtiss JN-4 'Jenny' trainer. Not as easy to fly as the Jenny, it augmented the Jenny in training American pilots during WW1



A second Standard is displayed, minus its doped linen covering. I'm always amazed by the intricate wood-working on pre-Golden Age aircraft, especially the carefully routed spars with integral shear webbing



A replica Dr-1 loops away from a kite balloon and over a Thomas Morse S4C. A popular advanced trainer during (and well after) WW1, the 'Tommy' was designed by a former Sopwith engineer



Left: Despite being the country with the first successful powered aircraft, the US had no military aircraft capable of surviving over the trenches when it entered WW1. So, the US bought aircraft such as the Nieuport 28, whilst awaiting the availability of the more rugged Spad XIII fighters. This museum-built reproduction incorporates parts from original Nieuport 28s



A versatile fighter and light bomber, Halberstadts were often the opponents of US Nieuports. This restored CL-IV is painted in the colours of the Schlachtstaffel 21 squadron leader



Looking like a large free flight model, the Kettering 'Bug' was the worlds first 'cruise missile'. Armed with a 180 lb warhead, the Bug was to be launched from a short track and dolly. Guided by pre-set pneumatic and electric controls, the Bug would cruise for a pre-determined interval, then the engine would stop and the wings would fall off. The Bug would fall and the bomb would detonate. Not completed in time for WW1, development was cancelled shortly after the Armistice was signed



The tri-motor, twin-boomed, triple tailed Caproni C.A. 32 to 36 series of bombers was the backbone of the WW1 Italian bombing force. Note the two fuel tanks immediately behind the pilots - no need to post a 'No Smoking' sign!



Designed by a French officer working with the American Packard Company, the two-seat Packard-LePere US Army Combat (LUSAC) 11 was a two-seat fighter, of which only a handful were built. Several soldiered on, doing valuable experimental work into the early 1920s



Boeing built the P-12 for the US Army, whilst a very similar model served the US Navy as the F4B-4. Known as a very nimble, fun to fly aircraft, many WW2 US aviation commanders learned their trade on the P-12/F4B series



In contrast to the nimble P-12E looms the massive (replica) MB-2 (later NBS-1, for Night Bomber, Short Range). The primary US bomber until the Keystone designs of the late 1920s, it was with MB-2 bombers that Gen. Billy Mitchell showed that the supremacy of the battleship was ending



Boeing's P-26 didn't have world-beating performance but it was the first American monoplane fighter



Like the P-26 the Martin B-10 was a major milestone in aviation, being the first US monoplane bomber with retractable landing gear, enclosed cockpits and an enclosed, powered gun turret. Seen above the B-10's mid-section are (top to bottom), a YPT-16 (prototype P-20, 21 and 22 series), PT-19 and Schneider Schulgieter ('School Glider') SG38



Fighters and bombers get everyone's attention, whilst utility aircraft are often overlooked. Such happened to the observation, mail and other utility aircraft built by Douglas in the 20s and 30s, and few survive. This, the only O-38 in existence, crashed in Alaska in 1941 and it wasn't salvaged until 1968



Another rare 'between the wars' bird is the Northrop A-17, one of only three surviving worldwide. The Army's last single engined attack aircraft, the A-17 is a direct ancestor of the immortal Douglas SBD Dauntless



Typical of a failed concept in Army support, the O-47 was too heavy for rough fields and too slow and clumsy to survive against fighters. Expensive, it had to be based at fields with paved runways. Its liaison and forward observation duties were instead performed by converted light aircraft, capable of staying with the troops and providing quick, responsive support



Another failed Army support/Observation type was the O-52 Owl. The last such O-bird ordered by the US Army, Owls were used as trainers for short range anti-submarine patrols



When Japanese aircraft struck Pearl Harbor a handful of pilots wasted no time getting their P-36 and P-40 fighters into the air. Second Lt. Philip M. Rasmussen of the 46th Pursuit Squadron was one such pilot, climbing into his P-36 whilst still in his pyjamas and scoring one kill before a pair of Zeros forced him down. Lt. Rasmussen survived, later scoring again against the Japanese



Fortunately, the Army bought the P-36 as a complimentary fighter to this Seversky P-35. Whilst the P-35 series did eventually evolve into the magnificent Republic P-47, that took time. Meanwhile, Curtiss was able to shoehorn the Allison V-1710 engine into their P-36 design, creating the P-40s used by just about every Allied air force during WW2



America's primary bomber in the late 1930s was the Douglas B-18, derived from the DC-2 (itself the ancestor of the DC-3). Whilst B-18s were essentially useless as bombers, they did serve to bring Reserve and National Guard pilots transitioning from open-cockpit biplanes to retractable landing gear, multi-engined and (relatively) high-performance monoplanes



An interesting feature of the B-18 is the retracting dorsal turret. Not much visibility upwards but it could be a nasty surprise to an attacker coming from behind



Left: What would a P-40 be without those ubiquitous 'sharks teeth'? The museum's P-40E Kittyhawk is painted in the colours of Col. Bruce Holloway, a pilot in the Flying Tigers and its successor, the 23rd Fighter Group

Right: Behind the P-40 hangs (top to bottom) a Schweizer TG-3a (a trainer for such cargo gliders as the Waco Hadrian), BT-13 Valiant, L-4 Grasshopper (J-3 Cub conversion), Fiesler Storch and a Culver PQ-14 target drone





Not as successful a fighter as the P-40, the P-39 proved to be a good ground attack aircraft and was surprisingly fast at low levels



The Bell P-63 was what the P-39 could've been, had Bell been allowed to equip it properly. This P-63E King Cobra is painted as an RP-63A, a variant equipped with lightweight armour, to serve as a target for aerial gunner trainees (with special, frangible ammunition in their guns). When a trainee scored a hit, a strobe in the spinner would flash



The Culver PQ-14 had a full, enclosed cockpit and could be flown as a nice little single-seater. Or it could be flown by radio control and blown to bits for anti-aircraft practice!



No, it isn't quite a P-51. The A-36, derived from the early Mustang design, maintained the early version's Allison engine and machine guns mounted underneath the nose. Visible above and below the wings are the brakes required for dive-bombing



The US borrowed several aircraft types from the UK during the war. A few of those at the museum include the Mosquito, Beaufighter, Mk. Vc Spitfire and this PR Mk. XI photo-recon Spitfire



Whilst most modellers focus on the better known, easier to fly B-25 Mitchell, the Martin B-26 Marauder deserves attention. B-26s demanded more from their pilots but gave back with higher speed, i.e.: "We've dropped our eggs, now let's get home before the fighters get here!"



The massive P-47D was the largest and heaviest single-engined fighter of the war. Armed with eight .50 calibre Brownings it wasn't as manoeuvrable as its opponents but it had a hefty punch and was rugged enough to bring home its pilot after a mauling



In contrast to the bubble canopied P-47D is this earlier 'Razorback' P-47D, painted in the markings of ace Neel Kearby, named by Kearby for his red-headed wife, Virginia



Often called the 'Bamboo Bomber', the Cessna UC-78 Bobcat (civilian T-50) was used by several Allied nations as a light transport, trainer and all-round utility aircraft. Some of us may recall that Sky King's first Songbird was a Cessna Bobcat (from repeats of the TV series, that is - I'm not that old... Stop snickering, Micki!)



Although not as well known as Enola Gay, Bock's Car underwent the same modifications to enable carrying an atomic bomb, which she dropped on Nagasaki on 9th August, 1945



This Macchi MC-200 Saetta was found abandoned at Benghazi, after El Alamein, by British forces. They gave it to the US, who sent it to America for a bond drive. It was later bought by the New England Air Museum, who then sold it to a private collector for restoration by Macchi's successor, Aermacchi, who restored it to its original, wartime markings



The Me 163B (foreground) is on loan from the Canadian National Aviation Museum; the Ju-88D-1/Trop behind was surrendered to British forces in Cyprus by its disaffected Romanian pilot. Nicknamed 'The Baksheesh', the plane was then turned over to the US for extensive testing



This Nakajima-built A6M2 Zero was found on New Guinea and is thought to have operated out of Rabaul. It may be hard to tell from the photograph but the aircraft is the colour of a cup of coffee with a lot of cream - very tempting to your reporting crew, who'd only had one cup of coffee during the morning of our visit!



Quite a contrast with the Zero's warm colour is the Yokosuka MXY7-K1 training glider's bright orange. Ballasted with water for training (the water being jettisoned when at low altitude), the glider probably was a challenging handful for an experienced pilot, let alone a novice

CONTACTS

NATIONAL MUSEUM OF THE USAF
www.nationalmuseum.af.mil

Next Time - The Jet Age!



Philippe Accart reads his beautiful Breguet Br 393T, a passenger tri-motor from the early days of Air France

Indoor Impetuosity

In the future we shall have to think of a new name for Dave Goodenough's column as he has returned to live in the UK. However, that will not be for some time yet as we have quite a few of Dave's ex-pat adventures to relay to you yet. So please sit back and enjoy yet another escapade with our Brit in Brittany!



Now that's a challenge for indoor flying! The Northrop N9 flying wing by Bruno Gueguen is a super but fast indoor gem, built using a 'traditional' balsa structure

For the past eleven years our club here in central Brittany – Les Fous Volants – have been holding an indoor 'spectacle' at the beginning of February. It's a show that has become a 'must visit and fly' for several of the best French indoor scale flyers, some travelling from as far as the Paris/Orleans area, a five hour drive for the dedicated!

There was one 'fly in the ointment' however, something my wife and I had been affected by during a winter trip up to the French/Belgian border – security checkpoints, due to the Paris attacks. We had been informed that due to our show being held in a military area the general public were to be denied access.

As I drove towards the camp of St Cyr-Coetquidan, the doom-sayer in me wondered

if it would cause any pilots to cancel? Oh, me of little faith! So what did I find? What were the assembled pilots doing – and was there anything to eat...? Read on...

Students And Stalwarts

Our twelfth show saw me, at first, wrangling through the camp entry procedure, surrendering my driving licence as I went, before managing to wend my way westwards through the military infrastructure and downhill to the large gymnasium, our club's indoor home for the winter flying season. Despite being required to park some distance from the building – security again – the car park held a surprising number of cars from other Departements. Things were looking



Denis 'The Music' is our P.A. expert. He was strumming a riff when this little lad joined in...

up! With camera bag and notebook in hand, I wandered in past the entry checkpoint and entered the gymnasé – quelle surprise!

Well my flabber was well and truly gasted; there was a cornucopia of models present. Some were old favourites but many were new; things were set fair for a super afternoon's flying.

Before I could do the journo bit, local customs had to be observed – a double bis (kiss) on the cheeks for the ladies and handshakes all round with the chaps. Or was that the other way round? Anyway, with the formalities dealt with it was off for a tour around the toys. And what an assembled bunch of beauties they were! From the almost museum-like model aircraft of Roger



Yann Dobignard's C160 Transall in threatening 'night' paint. A very able model that flies at a remarkably low speed and 'turns on a sou' thanks to the differential motor control



The pilot called it a 'Pou', but despite being a pastiche of an Henri Mignet HM14 it still flew well. 'Like a trainer', I was told and I was not surprised



The Noratlas is a bruiser of a freight aircraft from the 1950s. Philippe Accart hauls it around and drops a 'stick' of parachutists during its flight regime



The gunner sits nervously, awaiting the next sortie over the trenches. Johann Forgeard's Caudron G4 is a delightfully quirky model



You'd look manic too, perched in front of that bacon slicer! The Forgeard rendition of the SPAD A2 shows where not to place the gunner...

Nieto and Johann Forgeard, to prehistoric curiosities and beginners/debutants first offerings. All were present and all were welcome.

Why Aye Bonny Lad!

Grabbing the first pilot available found me interviewing one guy with a curious regional accent that I couldn't place.

The Alsace? No...

Gascony, maybe? Not a chance...

Finally, he relented and told me, in perfect English, it was Franco-Geordie!

Bruno Gueguen had been working in Blyth for the past three years and had stayed in the Whitley Bay area. He explained that the Blyth Valley radio model club had taken this wandering Frenchman under their wing, so to speak, giving him a mixture of friendship and air time, and proving that Geordies are kind to us Southern mortals. Bruno says hi to you all, chaps!

Although by no means an indoor only aficionado, he had crafted a few small 'traditional construction' aeroplanes, the most challenging being his rendition of the Northrop N9 twin engine flying wing, at a mere 600 mm wingspan. Close up it's a lovely little thing – but in the air it's a bit of a handful! Due to the pronounced wash-in on the wingtips it is stable in the air, but goodness it's very fast! The little wing zips around like a manic yellow and blue bat, twitching slightly as it whizzes through the slipstream of other, larger models.

His little DC3 was sadly sidelined through electrical problems and the pretty little 450 mm span Ryan PT-19 also stayed in the pits whilst I was in attendance. Bruno's foamie Pitts biplane used the same basic plan as several other of the type present but he'd reduced the plan size, down to around 500 mm span. Like all Pitts, whether full size or model, it flew beautifully, jousting with its bigger brothers in the gymnasium circuit.

At one point the general flying halted and a bevy of biplanes lined up in front of the pilots' position – it was time for all-Pitts play-time! The Forgeards, father and son, were chafing to be off, as was Phillipe Accart and Roger Nieto. Bruno tagged on with his baby biplane. Five rapid models in one small left hand circuit proved to be somewhat interesting...

Lots of dodging and weaving, high and low passes and 'just missed 'im!' interaction, before one pilot – he will remain nameless, but you know who you are – reversed direction! There was only going to be one outcome and it took mere seconds to occur. That horrible 'whack' when models meet and foam is ripped by a fast outrunner powered



Perky 'Pinkus' plaything is an indoor trainer and not a little fun either. Like it or loathe it, you can't ignore it!



Love that gorgeous structure! A lone Bleriot patrols the gymnase ceiling oh-so-slowly, with wings warping and motor whirring



'Wibur' wrestles with the controls in the Wright Flyer, a tiny 'tour de force' by Veyssiere



Bruno Gueguen in fast-fix mode after a mid-air – look at the cockpit 'canopy'!



Paired Pteranodons from Christian and Sylvie Veyssiere. They were seen in flight later searching for prey!

propeller! Two of the lovelies tumbled to the floor and Roger (did I say that?) carted the most injured device back to the pits for foam massage and cyano medication. I believe it remained hospitalised for the rest of the day.

Nieto Never Stops!

Whether building or flying super-detailed models, both indoor and his favourite warbird F4H 'international' models, Roger never stops building. I counted some eighteen indoor planes and two helis in his pits 'stable', from the lumbering DH2 to his supersonic SAAB Draken. All have the Nieto 'scale magic dust' sprinkled on them – they look fabulous and all fly well. I've yet to find out what large model is 'on the stocks' at the moment but I know without a doubt that it'll be another stunner. Perhaps you'll see it here first, if the editor allows?

Master (and mistress?) indoor modellers, Christian and Sylvie Veyssiere both build and fly 'stick and tissue' creations for the most part, but this year saw them delve into the far past for design inspiration and the present for materials. A mere 80 plus million years separated these Cretaceous creatures from their modern counterparts; Pteranodon by name, particularly disturbing, they cruised about as a hunting pair, accompanied by curdling calls from the PA system, care of 'Denis the Sound Man'.

Other models in their aviation miscellany included the tiny Wright Flyer of Christian, and Sylvie's delightful Demoiselle. They have a regular spot in one of the French model flying mags, disseminating information and passing on pearls of wisdom to all and sundry. Long may they continue to do so, as they have probably forgotten more than most of us model meddlers actually know!



Philippe Accart nestles among his wherewithals, waiting for the charger to finish its job before another foray into the gym sky



Prayer or prepping? Pierre 'Papy Jurca' Boissiere fixes his Gee Bee R3 after an airborne collision in the racing mayhem



A lovely little CAP10 in French Marines colours. A super little flyer, I didn't get the pilot's name



Detail from the Veysiere Etrich Taube. There's a lot of work in this fine-flying model. Slow, genteel and well-mannered

Instigation Of Impetuosity

One aircraft type that remains popular is the pylon racer – svelte of shape and powerful of motor. The GeeBee R2 was well represented at this meet and the floor was given over to four would be 'air rippers'. The pilots - Simon Idot, Thomas Mouge, Rene Quoniam and 'Papy Jurca' (Pierre Boissiere) – lined-up at the pilots' cage and prepared for combat. As the countdown ended the howl of quadruple outrunners rent the air, as did the four fast accelerating bolides. Straight into a high speed circuit, the models wobbled and weaved around each other, trying to gain advantage in any way possible, whilst trying to avoid the basketball equipment and heating installations!

Unfortunately, one rather excitable stick twiddler (I didn't catch which one) incurred the wrath of the 'Chef de Piste', my mate Yann, by overflying the pits at high speed and low level. All very exciting until you get a model trying to burrow itself into your head! With his job rightfully taken very seriously, Yann did the official 'ear whisper' and the overflying suddenly stopped. The threat of losing your transmitter and flying rights for the rest of the meeting had the desired effect. French verve had been curbed yet again!

Yann had his own model on display, the darkly threatening, all matt grey twin-engined

Transall. A big model for indoor, it spans around 1500 mm, yet flies very slowly, a testament to Yann's ultralight building skills and the 3-axis control plus differential motor, linked electronically to the rudder, I believe. I missed it in flight at the meeting but I have already seen it in use, both indoors and out.

He currently has a large scale Piper Cub under construction, also incredibly light for its size. You'll see it here in due course. Yann has promised me 'chapter and verse' on the build, lots of photos, plus the all-important lightweight building method.

He never uses wood-based products and everything he works with now is a composite in one form or another. He looks upon us wood-whittling traditionalists as un-reformable recidivists, forever banished to the misty wastes of history and hunting for the long-lost Grail of a full 50 packet of Swann-Morton No.1 'pointy' blades.

At the other end of the composite scale were the playthings; beginners kit models, one-off what-nots, the twin gyrocopter that Sylvie Veysiere wafted about, the low-winged 'thing' that no-one would claim ownership of, a pair of Pous (Flying Fleas), large, small and semi-scale – plus many indoor 'stunty things' that defied both description and gravity.

Also sitting there awaiting attention was a perky little 'Pinkus', complete with google-eyes on the windshield and a wan smile on its visage. All played their part in this modelling miscellany, and all were enjoyed by pilots and spectators alike – especially the crashes!

Parisian Perfection

Always in attendance, regardless of weather or other problems, are Phillippe Accart and his partner, Sophie; the pair make the long trip from Paris twice a year, the first in February for our indoor show, whilst we look out for them again in early May for the club's two-day extravaganza at our military runway outdoor summer home. They build remarkably detailed indoor models, not surprisingly as Phillippe has been a French team member in the world F4C championships before he and certainly knows his French onions! Sophie, too, has proved her worth and skills in competition.

They fly a remarkably eclectic group of models, from the detailed Noratlas with its load of parachutists deployed in flight, to his gorgeously detailed Breguet Br.393 tri-motor that trundled unhurriedly about the hall space, just as the original would have done when clawing for height leaving Orly back in the day.



Just a few of the Nieto 'stable'. The Pitts is a rarity as Roger usually fixates on warbirds of all types



Pretty or what? An unknown type to me (a Fokker?) wanders around, flaunting its gorgeous structure for all to see



A tiddly Gee Bee R3 attacks the pits area and gets too close to the camera for comfort. The pilot later 'had his wrist slapped'!



The Veyssiere Etrich Taube is such an 'atmospheric' model to watch in flight with all that 'string and strutter'



Forgeard's Pitts whistles by, close to my lens. Johann really wrings this one out, despite the limits imposed by our gymnase home



Pretty, quirky, ridiculous – you choose. Henri Mignet certainly designed something different with his Pous

Unfortunately I was forced to curtail my visit a little early. The French health system owes me a 'tin knee' and, until I elect to have it done, I sometimes falter in both ambulatory freedom and resolve. I was reliably informed that the flying continued until much later than the supposed deadline and the final flyers had be shooed out of the gymnase to allow the clean up crew to do their job.

Tail Enders

One of my copains at the club asked me a while ago, '...how do you manage to drill those perfect holes in balsa without making them ripped and ragged?'

I thought you might want to know, so here goes – arrow shafts and aerals! Although an ex-traditional longbow and wooden arrow user, I've also used aluminium and carbon/aluminium shafted arrows too with a modern recurve bow. These arrow shafts are a thin-walled extrusion of a relatively rigid Duralumin (I'm supposing) alloy and they come in a variety of diameters, from about 5.5 mm up to approximately 9 mm.

I've collected lots of 'dud' arrows – slightly

bent or otherwise damaged – and squirrelled them away as 'that'll be usefuls'. I cut a section of around 80 mm and at one end I use a small round or half-round file to thin the tube wall into a sharp cutting edge, sometimes cutting two or three notches in the tube wall to relieve any sawdust generated (usually when I 'drill' lite-ply).

Mounted in a battery powered drill set to slow speed, I offer up the cutting tube to the workpiece, press lightly to indent the wood surface to prevent the drill from 'wandering', then with only minimal pressure I trigger the drill. The resultant cut hole is always perfect, smooth-walled and the near dead size of the cutting tube used. Old aerals from radios, old transmitters and similar devices also work well for smaller holes but the chromed brass tubing is a little more fragile. The 'plug' that is drilled out can be removed from the cutter tube by shoving a suitably sized dowel or rod up the tube and tapping it out – a minor annoyance after producing a 'perfect' hole.

For bent arrows and broken shafts track down your local archery club and ask around. I find there are always cast-offs and chuck-

outs if you check.

Similarly, I was also asked how I cut a batch of matching oval 'portholes' from self-adhesive film. That one was care of a car sticker! I found a spare oval-shaped GB decal and used the photocopier in reduction mode, and printed it at the right size for my model. With the correctly sized oval now on paper, I cut it out and cyano'd the patch to a small piece of aluminium, glued to a length of 10 mm square balsa. The ali was then gently trimmed and filed to shape until the oval looked accurate. After that it was simplicity itself to hold the cutting guide in place on the adhesive film and cut a batch of 'portholes'. Yes, it's tedious, but at least all the ovals are the same size!

So there you are, two secrets revealed! If you have any you want to share why not get in touch at my new email address, but do attach photos please. **RCMW**

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 dizzythree@hotmail.com

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Slingsby T-49 Capstan

Product Code: FF38

The Capstan was Slingsby's last wood two-place design and reflected the British preference for side-by-side seating. It was planned as a replacement for the earlier T. 21B training glider. A great subject for those looking to build an easy-to-fly slope soarer of British design.

Related Products

Plan (MW2689): ~~WAS £22.50~~ NOW £20.25 + P&P



Sopwith Triplane

Product Code: FF35

With a fast rate of climb and high service ceiling, the 'Tripe,' as it was known, was highly successful in combat, so much so that it caused the Germans to begin prototyping their own Triplanes. Those looking for an interesting WWI scale subject need look no further!

Related Products

Plan (MW2787): ~~WAS £13.50~~ NOW £12.15 + P&P



Gloster Gladiator Mk1

Product Code: FF34

Although it was usurped quickly by newer monoplane designs, the Gladiator saw action almost everywhere during World War II with a variety of different air forces. It was the last British biplane fighter to be produced, but the first to feature an enclosed cockpit, which makes it a very unique project for the scale enthusiast.

Related Products

Plan (MW3344): ~~WAS £22.50~~ NOW £20.25 + P&P

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Full SET (SET3344) ~~WAS £173.48~~ NOW £147.46 + P&P



Extra 230

Product Code: FF32

Designed by award winning pilot, Walter Extra, the 230 was the predecessor to the popular Extra 300. This aircraft was, of course, built exclusively with competition flying in mind, which means that your R/C equivalent will be as impressively aerobatic and will keep up with the most advanced of flyers!

Related Products

Plan (MW2350): ~~WAS £20.50~~ NOW £18.45 + P&P

PETG Canopy (CA2350CY): ~~WAS £7.50~~ NOW £7.12 + P&P

FG Spats (CF2350ST): ~~WAS £18.50~~ NOW £17.58 + P&P

FG Cowl (CF2350CL): ~~WAS £21.50~~ NOW £20.42 + P&P



Fournier RF7

Product Code: FF31

René Fournier designed this single-seat motorglider in the early 70's, derived from the earlier RF-4D. Despite only being a prototype, this aircraft was fully stressed for aerobatics and was finished well. A great subject for powered gliding fans with a plan from renowned designer Peter Miller available to buy as well as a woodpack and canopy!

Related Products

Plan (MW3709): ~~WAS £13.50~~ NOW £12.15 + P&P

PETG Canopy (CA3709CY): ~~WAS £9.50~~ NOW £9.02 + P&P

Laser Cut Wood Pack (WP3709): ~~WAS £41.99~~ NOW £39.89 + P&P

Full SET (SET3709): ~~WAS £69.98~~ NOW £59.48 + P&P



Royal Aircraft Factory S.E.5A

Product Code: FF27

A fighter regarded by some as the best of World War I, the S.E.5A needs no introduction. This aircraft was highly manoeuvrable, had a good all-round view and was as capable offensively as it was defensively. A fantastic scale project, that when built, will see you being the envy of your clubmates. Duncan Hutson has designed a superb plan, available

from Traplet Shop, with multiple woodpacks, an ABS headrest, FG fuselage top deck, nose plate and cylinder head also for sale to complete the model.

Related Products

Plan (MW3290): ~~WAS £45.50~~ NOW £40.95 + P&P

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

Diary Dates

INDOOR

27th Jun '17

Waltham Chase Aeromodellers Indoor R/C Small Models Meeting at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL, from 7 pm to 9.30 pm. Admission: adult flyers £4, spectators and junior flyers £1. Proof of insurance required. Fixed wing models limited to 95 g (3.5 oz) including 2-cell (max) LiPo. Helicopters limited to 305 mm (12") rotor diameter. See www.wcaero.co.uk for more details. Contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Hants. 01489 895157

1st Jul, 7th Oct, 4th Nov, 2nd Dec '17

Indoor Flying at Furzeffield, Furzeffield Sports Centre, Mutton Lane, Potters Bar, Herts EN6 3BW. Times will be from 6 pm until 8 pm, flyers £9 and spectators £2. Rubber, free flight and small electric models only, wingspan will be limited to 20 inches. Enquiries to Mike Quille, 020 8500 3549, Email: mp.quille@live.co.uk

12th Sep, 10th Oct, 14th Nov, 12th Dec '17

Waltham Chase Aeromodellers Indoor R/C FPV Meeting at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL, from 7 pm to 9.30 pm. Admission: adult flyers £4, spectators and junior flyers £1. Proof of insurance required. Model size/weight limitations apply. All models to be 25 mW 5.8 GHz or WiFi equipped. Video frequency control system will be employed. See www.wcaero.co.uk for more details. Contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Hants, tel. 01489 895157

14th Oct, 11th Nov, 9th Dec '17

North London MFC Indoor meeting, at Furzeffield Sports Centre, Potters Bar, Hertfordshire EN6 3BW. From 6 pm until 9 pm. All up weight limited for fixed wing 225 g, 36 inch span, helicopter 400 g. BMFA insurance required. Contact Peter Elliott, Email: ianelliott56@btinternet.com

GENERAL

16th to 18th Jun '17

Weston Park International Model Air show, organised by Wrekin MFC, at Weston Park, Weston Under-lizard (M54 Junction 3 and 8 Miles off M6 Junction 12). Helifest RC helicopter flight line all weekend, with commentary by Dave Bishop (D.B.Sound) and Nik Johnson. A host of top pilots and fantastic Trade support over with 100 Traders. Full size display all 3 days, inc. the Swift Display Team. Show also includes: Quad Racing and Quad Fair, Off Road Buggy Racing, Model Boats and other family attractions. On site Camping available, with Night Show spectacular Friday and Saturday night, with Evening entertainment. For more information contact Steve Bishop 01952 587298, Mobile 07758 895068, Email: stevenbishop@blueyonder.co.uk, show website www.westonparkmodelairshow.co.uk, Trade Enquiries Peter Whitehead 01952 684169

23rd to 25th Jun '17

UK F3A World Cup League Event. Near Ashford, Kent. International entry. Visitors welcome. Food and essential facilities on site.

See www.gbrcaa.org/World Cup/ or contact Contest Director Matt Hoyland on 07739 840498 or Ashley Hoyland on 0114 2873432 for more details

24th & 25th Jun '17

Wings and Wheels Model Spectacular, North Weald Airfield, Essex CM16 6AR. Only 2 miles from Junction 7 M11 motorway. 9.30 am – 5.30 pm. Enormous R/C Model Show with model air displays all day with commentary from Nik Johnson, Bring and Buy for modellers, Boat Pool and indoor display, masses of Traders, R/C tanks, trucks, hovercraft, daleks and lots more! On site licensed bar and catering. Weekend camping available. All enquiries: www.wingsnwheels.net, Email: admin@wingsnwheels.net, Tel: 01242 604126

1st Jul '17

GBR/CAA F3A League competition. Skelbrooke. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Ashley Hoyland on 0114 2873432 for details

1st & 2nd Jul '17

PSSA 'Fly for Fun' event with the Lleyn MAC, Nr Abersoch, North Wales. Meet at the Londis car park in Llanbedrog for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: webmaster@pssaonline.co.uk

1st & 2nd Jul '17

Woodspring 2017, at Woodspring Wings model airfield Claverham Drove Yatton, North Somerset. Signposted from the M5 J20 and BS216TZ will get you close. 10 am to 5 pm both days. Our 25th Anniversary show and we're working on some very special attractions this year, in addition to our normal full flying programme from top teams and pilots, more traders than ever and a chance to eat and drink in the wonderful Somerset countryside. Camping available for the weekend. Watch facebook and our website, www.woodspringshow.co.uk for updates

7th to 9th Jul '17

F3A World Cup League Event. Bordeaux, France. Please contact Ashley Hoyland on 0114 2873432 for details

9th Jul '17

Haverfordwest Model Club Fly-In, at Templeton Airfield, Pembrokeshire, at the site owned by the MOD. Flying starts at 10 am, following the pilots' briefing. There is no charge for admission, flyers please bring BMFA membership card with you. Event open for flyers of radio control model aeroplanes and helicopters. We have an attractive setting, friendly members offering a warm welcome, refreshments in the way of a burger van and an ice cream van, both excellent! There is also an area set aside for people to sell their surplus models and hobby related engines, spares etc. For further information please contact Greg Highfield 01437 899843 or 07913 781150 or Email: greghighfield@hotmail.co.uk

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 Traplet Publications Ltd. are unable to take responsibility for event cancellations. Check before you go.

9th Jul '17

Traplet War of the Roses flying scale competition Round 2, hosted by the Wirral Radio Control Flying Society, at Arrowe Country Park, Woodchurch CH49 5LW. Flying only scale competition for fixed wing aircraft sponsored by RC Model World. Pilots of models weighing over 7 kg need a 'B' certificate to fly. For more information contact Peter Maw, petermaw@outlook.com

9th Jul '17

North Somerset Modellers Society Model Show, at the The Helicopter Museum, Weston Heliport, Locking Moor Road, Weston-Super-Mare, North Somerset BS24 8PP. From 10 am to 5.30 pm. See Museum website for admission charges. Free parking, restaurant. Raffle for a Helicopter Flight (not on the day). For more information please contact: John Annegarn on 01934 417742 or john.annegarn@sky.com

16th Jul '17

GBR/CAA F3A League competition. Grimsby. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Dave Tofton on 07809 490847 for details

23rd Jul '17

F3A. 4th BMFA GBR Team Selection Event. Mansfield. FAI 'P' and 'F' schedules. Also GBR/CAA League competition, all schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Brian Hoare on 07962 358470 for details

30th Jul '17

GBR/CAA F3A League competition. Warboys. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Clive Whitwood on 01487 832195 for details

5th & 6th Aug '17

GBR/CAA Championships. BMFA National Flying Centre. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact GBR/CAA Competition Secretary Adrian Harrison on 07976 244004 for details

5th & 6th Aug '17

The Robert Mahoney Memorial Electric Fly-In, at Middle Wallop, from 9 am to 4.30 pm. Entry via Museum Gate. Electric only, no Free Flight, BMFA A certificate or equivalent. Over 7 kg requires 'B' or better. For more information contact Dave Chinery, Email: daviddchinery@aol.com, Tel: 07702 455777, or J. Bassett, Email: jbassett@efuk.net

6th Aug '17

Skelmersdale MAC Annual Fly-In. Low key Scale event and all are welcome. Proof of insurance required. Location is just off J4 of M58, South Exit (VN8 9TH). For more details contact: Andrew Bowman on 01942 716522, or Email: Andrew.bowman23@gmail.com

12th & 13th Aug '17

Redruth & District Model Flying Club 26th Annual Summer Show, from 10 am to 5 pm both days, along with our club pilots there will be again a number of local club pilots and guests. We can cater for campers wishing to make a week or weekend holidaying visit, and there will be barbecue catering on site. Modellers wishing to fly at the show please contact for model flying forms etc. Contacts, Steve Polkinghorne 01209 313263, Email: stevwings55@tiscali.co.uk, or Alan Greenfield on mobile 07706 929494

18th to 20th Aug '17

Festival of Flight at Ragley Hall, run by the Wrekin MFC. New dates confirmed, further details to follow but show will include many famous international flyers from the UK and Europe, as well as the amazing Richard Goodwin with his full size Pitts Special, which will guarantee to give the event that special Wrekin MFC touch, plus the Glider FX team will be there all weekend, running concurrent with the air display but on different parts of the park. There will be the Helifest model helicopter competition and display, Quad First Person View Racing, a large Boating Regatta on the eight acre lake and Model Car Racing. Saturday evening will feature laser lights fireworks and light show! A large trade participation is anticipated as well as a swap meet. Admission prices: Adults £14.00, children £7.00, family £30.00, camping £65.00 pre paid, £70.00 on gate. For more details contact: Steve Bishop, Tel: 01952 587298, mobile 07758 895068. Trade enquiries call Peter on 01952 684169. www.festivalofflight.uk/

19th & 20th Aug '17

PSSA 'Fly for Fun' event, The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: webmaster@pssaonline.co.uk

26th to 28th Aug '17

F3A at the BMFA British National Championships. RAF Barkston Heath. Entries through BMFA

2nd & 3rd Sep '17

F3A Triple Crown. Invitational team competition: England, Ireland, Scotland. Venue: Heswall, Deeside. Visitors welcome but please contact Competition Director Brian Hoare on 07962 358470 for details

9th Sep '17

GBR/CAA F3A League competition. Beaulieu. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director Ian Mould on 07774 473745 for details

10th Sep '17

Basingstoke Model Aero Club Electric Fly-In, at the flying field at Harrow Way, RG25 3AR. Gates open 9 am, pilots' briefing 9.45 am, flying starts 10 am. Pilots must have at least a BMFA 'A' cert and show evidence of insurance. Entry is FREE and there will be a trophy for best model. The Club has a large (130 m x 50 m) well-maintained grass flying strip. Food and drink available and toilet provided. Further location and contact details on bmacuk.co.uk

16th Sept '17

GBR/CAA F3A League competition. Skelbrooke. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director Ashley Hoyland on 0114 2873432 for details

22nd to 24th Sep '17

Lleyn Model Aero Club Bring and Fly, at Penyberrth, Pwllheli LL53 7HG. Come and join us at our annual event, this year being our 30th anniversary, so come and experience flying in the beautiful Lleyn Peninsula, in North West Wales. Our fantastic flying site and brilliant slope sites are always very popular with flyers and spectators alike, we have on-site refreshments, camping and caravanning, including static caravan hire at site adjacent to us. There is also a cafe and bar on-site serving food and drink day and night, and where we get together on Saturday night. For more info contact, Email: secretary@lleynmac.org.uk or Frank Pilling on 07867 361905

1st Oct '17

GBR/CAA F3A League competition. Sculthorpe. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director Peter Jenkins on 07725 314950 before travelling

7th Oct '17

GBR/CAA F3A League competition. Baldock. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director Steve Edwards on 07920 006217 for details

7th & 8th Oct '17

PSSA 'Fly for Fun' event, The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: webmaster@pssaonline.co.uk

8th Oct '17

SAM 35 Vintage R/C and Control Line Fly-In at Middle Wallop Army Airfield, Hampshire. All are welcome but please note that there will be no freeflight and that only 2.4 GHz is permitted. No BMFA Certs are needed, but current membership of the BMFA is mandatory, so please have your Membership Cards with you. There may be 'Tomboy' duration competitions, if there is enough support. Control-line activities will include the 'Bee Bug Bash' and other events, plus sport flying. Note that freeflight is not permitted. The Gate will open at 9.30 am, Army Museum entry charge £6 per person, plus £5 per person for SAM 35 (excluding wives, partners and children). Enquiries to David Lovegrove, Tel. 01491 200558, Email: david.lovegrove11@btinternet.com or visit www.sam35.org/events for details.

14th Oct '17

Tone Valley Autumn Model & Hobbies Show, at West Monkton Village Hall, Monkton Heathfield, Nr Taunton TA2 8NE. 10 am to 4 pm. Refreshments available. All types of models and hobbies displayed, trade stands and a table top sale. £2 entrance fee, under 14's free with a paying adult. Enquiries & entry forms please contact (club sec) on Eddy Grant 01823 283077

5th Nov '17

Retford Model Flying Club Winter Swapmeet, at Babworth Road Sports & Social Club, Babworth Road, Retford, Notts DN22 7NJ. Table set up from 9.30 am (Small table £4, booked in advance. £5 on the day. Large table £6, booked in advance. £7 on the day), doors open 10 am – 12 pm, Admission £3. Hot sandwiches, tea, coffee, available from 10 am. For further information and bookings contact, Chris on 07966 764803, Gerald on 07941 867130, or Email: secretary.rmfc@sky.com Website: www.rmfc.org.uk

14th Nov '17

Southend Radio Flying Club Table Top Sale. The Ecco Club, Thornford Gardens, Southend on Sea SS2 6PU. Start time 8 pm to 10 pm. Tables set up from 7.30 pm, Entry £2, Tables £4 (includes entry), please book tables in advance. Refreshments available from the bar. Further information from, Les Baynham, Events Organiser, Southend Radio Flying Club, Email: flyles@hotmail.co.uk or contact Les or Den on 07729 421939 or 01702 295988

18th to 28th Nov '17

F3A World Championship. Argentina. See www.f3argentina.com.ar/. If you need more details please contact Ashley Hoyland on 0114 2873432

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Great workshop shot of Sid King's Walt Good 'Rudderbug' in the making. Was this late 1940's classic the first commercially published plan for a radio controlled model aircraft?

The Sport Channel

In this month's varied sport flying topics, Gray offers up an early home movie of model flying and puts together a supersonic sequel

“There's no such thing as a bad Home Movie...”
(John Waters)

This Month's Wise Words

Just the other day, during a long online trawl for some information for this column, it occurred to me there was a certain irony in the fact that technologies that are focussed so resolutely on the future have managed to open up undreamed of insights into our past.

In a time when cameras are built into every kind of media device and grabbing instant still and video images are almost reflex actions, generations growing up with such things would probably find it hard to grasp that at one time, taking moving pictures of any aspect of everyday life was, unlike today, not an activity for the many.

Luckily for us, model flying and home movies have co-existed supportively during both hobbies' long histories. Now, as more and more of this precious footage makes it onto the internet, not only does it become preserved for posterity way beyond the life of home movie film stock, it also reaches an audience almost unimaginable to the original cameramen.

The reactions to old modelling movies are very telling, to established modellers of a certain generation, including myself as they often bring to life what had only been still images in our early model magazines.

Comments from younger viewers can be hilarious, though perhaps understandable:

“I never knew that this hobby went back so far! Like, they had radios and engines and stuff...”

Yet another, having viewed some postings of 1950s and 60s modelling, wrote something to the effect that, “These guys were true pioneers – they made things easy for us!” While I see what he meant, I'd like to think that our forerunners passed on an expanding knowledge and skills base, rather than improving our ability to unbox shiny consumer goods.

Of course, model flying has had many encounters with the mainstream movie media and in recent years a huge amount of newsreel clips have appeared online. The events captured in these features, on professional equipment, are invaluable. Many of them though are let down by truly crass voice overs, clownishly uncomprehending of the images they're describing and desperate to apply a showbiz 'spin', but as such they're very much a product of their time.

Our recommendation a while ago of the Keil Kraft factory tour video was well received and I'd now like to direct you to another evocative piece of aeromodelling/social history. A friend sent me a link to a home movie of a pre-war flying session of the Warrington M.A.C. Shot in 1937, it shows an enthusiastic club with a wide age range flying free flight models.

Their building, flying and trimming skills are very apparent. The quality of the movie image is not great but it adds greatly to its overall charm, almost like viewing the action through the mists of time. A lovely touch is the addition of an understated but touching and poignant music soundtrack. Have a look and tell me what you think.

While we're on this nostalgic theme, a mail came in from local modelling legend Sid King who raises an interesting point about the Vintage genre. Sid writes:

“Just a quick pic of my new model, Walt Good's 'Rudderbug', in tissue and dope, ready for nylon. A question for you – would this have been the first published plan for a model specifically designed for R/C?”

It was designed in 1947 and flown in 1949. I have failed to find dates for the ED Radio Queen, and the KK Falcon and Junior 60 were of course sold as Free Flight. Are there any other contenders?”

Now there's a subject to exercise SC readers, Sid! Although the development of R/C model aircraft by hobbyists can be dated to the 1930s and even earlier, at what point would the progress in radio equipment and model design have made a commercial R/C model plan viable? The more I think about it, the more I realise I wouldn't know where to start! What are your thoughts and evidence on the subject?

Supersonic Sequel

For a lighthearted, one off feature our 'Concorde Over The Cotswolds' PSS sequence continues to generate a lot of interest.

This has included a number of requests about obtaining a foamie Concorde as flown by Horst Fenchel in our piece. Although Horst modified his model for pure glider operation,

manufacturer Robbe's Concorde, as kitted, was designed for electric power. This, I believe, consisted of two Speed 400 motors with pusher props, which should instantly date anyone who remembers that technology! If the number of video postings online are any indication a great many are still flying worldwide.

Obtaining an untouched kit isn't as difficult as you might imagine and searching eBay and similar sites should find one. Let me know if you get lucky.

A slightly odd twist in the Concorde plot occurred when, not long ago, I showed the article to a senior local politician for Cheltenham. He was fascinated but initially startled by a British Airways Concorde apparently rampaging at low level through the tranquillity of Cleeve Common and narrowly avoiding the TV masts.

Having read the text though he was intrigued and delighted by the simple illusion and artifice of those shots. He did say, however, that he was more than pleased that such an incident never happened for real, as the inevitable fallout would have landed on his desk!

Another Concorde related item coincidentally emerged while I was doing more unpacking from my last house move (yes, it really is taking that long). I rediscovered an extraordinary history of Concorde, which I'd read some years ago,

intending to review here, but somehow got sidetracked.

First published in 2003, 'Supersonic Secrets' by Rob Lewis was one of the first comprehensive histories of Concorde, from its origins in the 1940s, through the early development of supersonic flight and its subsequent commercial career. It is an extraordinarily readable work that many found difficult to put down and this book, at the time of its publication, revealed facts that were not then common knowledge or in the public domain.

Examining the background to Concorde's ultimate fate, the author explores the political dealings and cover ups that seemed to plague the project from its inception, and studies the events leading to the Paris crash in 2000 that ended the first supersonic transport era.

Although other titles have since been published subsequently, drawing on more previously secret and sensitive information, released later, none have quite matched the compelling style and pace of 'Supersonic Secrets' that singled out this relatively compact and concise title when first released. Perhaps an updated reprint is overdue?

We can recommend tracking down a copy either through secondhand bookshops or online where it frequently appears in listings.

'Supersonic Secrets' by Rob Lewis was published by Exposé, ISBN 0-9546617-0-2

Above left: Discovered as a result of our housemoving operations last year, 'Supersonic Secrets' by Rob Lewis was an extraordinary exposé of the true background of the Concorde programme and its ultimate demise



More From The I.O.M

No sooner had we featured Mike White's 'Adrenalina' flying wing than Mike was in touch again with more projects from his ever productive building board on the Isle of Man. Mike mailed:

"The 'Restoration Drama' you wrote of previously is happening in my shed at the moment! Well, not quite a 'restoration' but more a continuation of a plane I started some 12-15 years ago. This is the 'Super Duper Super Looper'. It was built at the beginning of the 3D period and although it flew several times, I got quite a lot wrong.

One thing is the control system, which is not rigid enough, allowing the surfaces to move under load. They are also too big, which without some static balancing, flutter if the speed is allowed to get too high. I did fully balance the rudder but I found that it required about 4 ounces of lead to do the job.

Anyway, just last week I thought that, with the summer coming, I would have another go at getting things correct. I'm now trying to put some balancing onto the surfaces. The span is 85 inches and the weight 14 lb. I have an ST 3000 in the nose, which I have 'ignited' for petrol, which swings a 20" x 8" prop very nicely. Hopefully I will get it airborne soon. I will keep you posted."

The 'Midnight Blue' is from 6 mm Depron. The weight came out at 2.5 lb and the Overlander 3536/05 1500 KV motor turns the 9 x 5 prop from a 3000 mAh, 3S LiPo. Controls are elevons and rudder but the latter is not quite necessary unless the rudders are installed at a greater angle. They may then be mixed with the elevons as 'ailevators', making the flying crazily crazy! Traplet have the material for a plan article. (Bring it on! - SC)



More from the ever expanding fleet of Mike White from the Isle of Man. 'Super Duper Super Looper' is Mike's giant take on the 3D concept. 85" span with AUV of 14lb and ST3000 power

The Power House, 33 inch span, was built way back in 1989 and only flown once - F/F naturally! The motor was not up to power or the prop was too small – or too big – so the flying was not satisfactory. It has languished on the ceiling ever since but it will be worked on during the summer. I do not know what the motor is except to say that it has a red cylinder head and maybe a 'Pet'. I may have my drawings of this somewhere up in the loft and, if so, I may put it up to the Editor for consideration – someone may like it!"

Astonishing output as always, Mike. We're at that time of year now when some modellers can be persuaded to assemble their handiwork outdoors for a 'Fleet Shot'. If anyone's up for it, we'd love to see your creations en masse.



As a contrast to Mike White's giant models and fast electrics, this is his very cute scale-down of the Sal Taibi 'Powerhouse' vintage design. The model is nearly 30 years old. A plan would be nice, Mike...



'Midnight Blue' stealth fighter is a piece of classic Mike White Depron electric design. 1500 KV motor drives a prop-in-a-slot. You just know it's going to be quick. Choice of control mix offers 'impressive' to 'outrageous'!

Meanwhile, Back On The Farm...

Finally, can I just include a quick reminder to readers about my club's little summer event, the North Cotswold MAC's 'Fly For Fun', which will be held once again at Far Heath Farm, Moreton-in-Marsh, Gloucestershire over the weekend of August 12th and 13th. We'll be offering our usual programme of informal flying and regular attractions, plus camping facilities.

We'll be holding our popular but informal 'Designers' Events' again and this time they will be, on Saturday, any model designed by Ray Malmström and, on Sunday, Chris Foss' world famous Wot 4.

In both events, models can be in any form, in any size and with any power unit. See you there?

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



Just a gentle reminder to SC readers that the North Cotswold MAC's 'Fly For Fun 2017' event will be taking place on August 12th and 13th. Come and enjoy some of the best flying of the summer! All welcome, as ever

CONTACTS

NORTH COTSWOLD MAC
www.ncmac.co.uk

WARRINGTON M.A.C 1937 VIDEO
youtu.be/4FbzND8zi8

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Messerschmitt Bf109



Wingspan: 24"
Radio Functions: 3
Designer: Adrian Britton
Plan: (MW3047)
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Heinkel He 51



Wingspan: 54"
Radio Functions: 4
Designer: Fred Holdstock
Plan: (MW3572)
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Hawker Typhoon 1B



Wingspan: 83"
Radio Functions: 6
Designer: Sepp Uberbacher
Plan: (MW3564)
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PETG Canopy (CA3564CY):
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FG Cowl (CF3564CL):
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Radio Functions: 3
Designer: Christian Moes
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Designer: Keith Humber
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Wingspan: 53"
Radio Functions: 4
Designer: John Blakey
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Plan: (MW2846)
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Regianne RE-2000



Wingspan: 44"
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Designer: Robin Fowler
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Wingspan: 42"
Radio Functions: 3
Designer: Robin Fowler
Plan: (MW3171)
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P-51D Mustang



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Radio Functions: 4
Designer: Phil Burgess
Plan: (MW2988)
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PETG Canopy (CA2988CY):
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**Messerschmitt Me 108
Taifun**



Wingspan: 77"
Radio Functions: 4 - 6
Designer: Simon Delaney
Plan: (MW2945)
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FG Cowl (CF2945CL):
WAS £24.50 NOW £23.28 + P&P

Ju 88G



Wingspan: 98.5"
Radio Functions: 3 - 4
Designer: John Ranson
Plan: (MW2902)
WAS £25.50 NOW £22.95 + P&P
PETG Canopy, ABS Cowl,
Spinners SET (CA2902SET):
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Fieseler Fi-156 Storch



Wingspan: 93"
Radio Functions: 5
Designer: Dennis Bryant
Plan: (MW3466)
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Full SET (SET3466):
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Wingspan: 49"
Radio Functions: 4
Designer: John Lockwood
Plan: (MW3202)
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PETG Canopy & ABS Construction
SET (CA3202SET):
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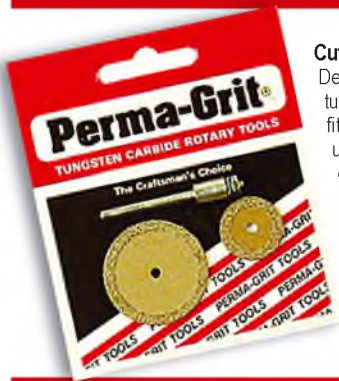
Wingspan: 48"
Radio Functions: 3 - 4
Designer: Brian Thorn
Plan: (MW2717)
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Wingspan: 53"
Radio Functions: 4
Designer: Peter Miller
Plan (RC2133):
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Clean Sweep



Wingspan: 36"
Radio Functions: 4
Designer: Tim Hooper
Plan (RC2092):
WAS £12.50 NOW £11.88 + P&P
CNC Wood Pack
WAS £44.99 NOW £42.74 + P&P
Additional Wood Pack
WAS £56.99 NOW £54.14 + P&P

Mudry Cap 20L



Wingspan: 53"
Radio Functions: 4
Designer: Peter Miller
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Radio Rock 2



Swedish aeromodeller, Owe Carlson has sent in plans for his 48" span modernised version of a cabin style old-timer that is based on a model that he first built over 50 years ago. The original plans are long lost but Owe remembered enough details to draw up a new version, with the help of some pictures of his original Radio Rock. RR 2 uses a brushless electric motor set-up and flies using three channel radio.

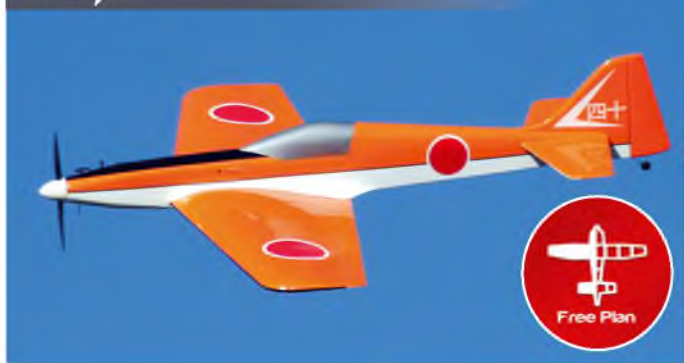
Learning To Use Lithoplate



In our next 'R/C Technique' feature Grahame Wren shows how to add realistic metal panels and other items to your scale model using discarded printing plates. Lithoplate is thin aluminium sheet, about 0.2 mm thick, used in the printing industry. Modellers use it for scale detailing wherever the full size uses metal, annealing it where it covers double curvatures. In this informative article, Grahame describes the processes involved and demonstrates how lithoplate can be used to add lightweight metal panels to your next scale aircraft.

AUGUST 2017 ISSUE ON SALE THURSDAY 20TH JULY

Yonju



After a long lay-off from IC engines, John Rutter started to look more closely at four-stroke engines, eventually buying a Saito FA-40. He designed Yonju (based on the Japanese for 40) especially for this engine, although other similar size engines should fit. John quite fancied a low wing design and he also fitted electric retracts to help retain the sleek lines of this 54 inch wingspan aerobatic model.

PLUS...

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

**All contents are subject to change without notice*

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