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Contents

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FRONT COVER

The CL-84 'Dynavert' was a developmental V/STOL aircraft developed by Canadair between 1964 and 1972. It used a mechanical mixing system on the controls whilst transiting between hovering and forward flight. This remarkable aircraft has now been replicated by Hobbico and thanks to the latest 3-axis gyro stabilisation and multicopter technologies we can now all enjoy trying our hand at a spot of VTOL flying. Read Andrew James' review on this eye-catching model, starting on page 22

REGULARS

REVIEWS

FEATURES

Pre-flight

Kevin Crozier
Editor | Radio Control Model World
Contact me either by post:
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Traplet Publications Ltd
Willow End Park, Blackmore Park Rd,
Malvern WR13 6NN. UK
or email: rcmw@traplet.com

Welcome to the May issue of RC Model World. The first order of business this month is to let you know that we've redesigned your favourite R/C model magazine. This needs to be done from time to time to keep the publication looking fresh when compared to all the other titles that it has to compete with on the crowded shelves of the newsagents and supermarkets.

Our designer, Nick Powell has been working hard on the re-vamp, so we hope you will appreciate his efforts. Of course, it's rarely possible to get everything right straight away, especially when operating to the tight schedules of a monthly periodical. So please bear with us as we tweak things over the next couple of issues to get the magazine looking as best as we can. And if there's anything that concerns you about our 'new look' then please do let us know by writing to Traplet's postal address, or the magazine's email address: rcmw@traplet.com

My other duty this month is to bid a fond farewell to Chris Golds, who has decided to give up writing his Light Fantastic column after a remarkable 214 editions. Chris started as a Traplet columnist in Electric Flight International in April 1998 and he continued to contribute when EFI became Quiet & Electric Flight International, which was Traplet's magazine dedicated to R/C gliding and electric flight topics.

When Q&EFI sadly ceased publication recently there was one lament that seemed to drown out all others, and that was how much Traplet's readers would miss Chris' column. After a couple of months it was decided to reinstate 'The Light Fantastic' as a bi-monthly feature in RC Model World and Chris was asked to join our team of regular contributors.

Sadly, after just a couple of articles, Chris has decided not to continue. So this issue contains the final chapter in his long career as a Traplet columnist. Hopefully we will be able to tempt him back from time to time as a contributor in other ways, so that he can continue to educate and entertain our readers for many more years to come.

Now let's take a look at some of the other articles in this month's RCMW, starting with our free pull-out plan feature. Mayfly-6e is a graceful 56 inch wingspan polyhedral electric glider and it is the latest in a long line of glider designs that Chris Ward has been developing over the years. Popular model designer Peter Miller returns with his latest Feature Plan, which is for a 1/6th scale model of a retro styled US homebuilt, the Aerolab LoCamp. Peter's model suits .40 – .52 cu in four-stroke engines.

Our cover star this month is the remarkable CL-84 Dynavert from Flyzone. Easy to build and surprisingly easy to fly, this innovative tilt-wing model is sure to be a big hit at flying fields this summer. The ST Models Seawind is also an unconventional bird, being a pylon engine mounted amphibian that is at home whether flown from land or water.

Amongst our feature articles this month you will discover how to fit a small action camera to film your models in flight from unusual angles, how to make a simple but highly effective wing jig and all you need to know if contemplating adapting a large IC powered aircraft to electric power. We will also be joining the Large Model Association's members as they get an exclusive look inside the restoration centre at the RAF Museum Cosford, where such rare aircraft as a Vickers Wellington and Dornier Do17 are being pieced back together.

Until next time...

Happy flying!

Kevin

CHECK OUT PAGE 14 FOR OUR LATEST SUBSCRIPTION DEALS

RC MODEL WORLD

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Take Off R/C News and Views

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

PANDAS Single Channel & Retro Fly-in

Now in its fifth year the Single Channel & Retro R/C Fly-In organised by Shaun Garrity and Phil Green, and hosted by the Pontefract And District Aeromodellers Society (PANDAS), will be held on Sunday June 5th, 2016.

Last year's event was a huge success, despite a challenging breeze, with 140 plus visitors and with 50 or so of those actually flying. There was a wide range of model types and the variety of old and resurrected radio gear was fascinating. There was also a new trend for 'replica' equipment, which usually have better build quality than the originals that they mimic! Since 2010 Shaun and Phil's small band of Single Channel & Retro enthusiasts has grown and they now have a multitude of S/C friends all over the world, co-ordinated via a dedicated forum: singlechannellersreunited.co.uk.

For 2016 the guys are expecting to see some fascinating 'new' gear, in particular 'Galloping Ghost' and 'Pulse Proportional' sets, which are making a comeback in their modern guises. Quite a few GG models are destined for Pontefract so if you've never seen a Galloping Ghost set up then you are in for a treat!

Saturday 4th June will be open as a fun-flying day, whilst Sunday the 5th sees the actual S/C and Retro RC Fly-In. The event is informal but there will be a just-for-fun spot landing comp and a few prizes for anything special that catches the eye. Every year has an optional 'themed' session. Previous events have included: a 'Sharkfest', a full squadron of Mercury Galahads and a formation of Veron Impalas. Last year there was a 'Boddo' theme and this year the lads are hoping to see a few biplanes and unorthodox models, such as the flying washboard!

Eligibility for the Single-Channel event isn't hard and fast but it is suggested that models ought to have either:

1) A single control on the transmitter, i.e. a button or one single axis stick. Basically a recognisable 'single channel' transmitter with no limit on 'compound' control surfaces.

2) A single controlled surface, i.e. a rudder, but no other control surfaces. This accommodates anyone with a rudder-only model using one channel of a modern proportional radio set. Ailerons only is OK too.

Power can be electric or IC but a throttle or a means of remotely cutting the engine of a wayward model is desirable. 27 MHz superhet sets should be used with caution as the flying site is 600 metres from the M62, with the possibility of CB-equipped lorries passing at any time. Super-regen equipped models are very welcome but for display purposes only due to safety reasons. Other bands, i.e. 35, UHF & 2.4 are fine to use at Pontefract. There will also be a busy control line circle.

Pontefract Park is located in the south west corner of Junction 32 of the M62. Access is via a huge white gate 1/4 mile south towards Pontefract. Please refer to the map provided on www.pandasaero.co.uk and for sat nav the nearest postcode is WF8 4QD.

Updates will be posted on the PANDAS website (www.pandasaero.co.uk) and also on www.singlechannel.co.uk as plans develop. Any enquiries should be sent to Shaun AND Phil (please cc both). This will ensure that you get a reply:

museum@garritys.net

philg@talk21.com

A Veteran Takes To The Skies

A Liverpool armed forces veteran, who was paralysed from the waist down after a motorbike accident, has found a new lease of life by taking to the skies. And he hopes to instil fellow veterans with the same passion for flying.

Alex Krol, 33, of Formby, has credited the charity Help for Heroes with supporting him in his recovery after his accident in 2005, which led to the end of his military career with the Royal Marines. The Charity has provided him with more than £18,000 in grants.

Paralysed from the chest down with serious spinal injuries, Alex is a full-time wheelchair user but he never gave up on his dream to pilot an aircraft. He said: "I was gutted to leave the Marines. I was young, ambitious and having the time of my life before my career was cut short.

"After the accident, I was in a bad way for a couple of years but I soon realised I was still fit and I tried as many activities as possible."

In 2008, Alex applied for a scholarship with Flying Scholarships for the Disabled. He went to RAF Cranwell and was lucky enough to get a full scholarship for 45 hours flying in South Africa to do his Private Pilot's Licence.

Currently Alex has to travel from Liverpool to London to use a plane especially adapted for disabled people to fly, but hopes soon that hand-controls will be ready to fit to a plane at Liverpool's John Lennon Airport. He then plans to introduce flying to other disabled veterans in the area through flying school Ravenair. Alex is also actively involved with a disabled flying charity called Aerobility.

He said: "We are hoping to host Help for Hero Flying days throughout 2016 for wounded injured or sick personnel to come and try their hand at flying. Hoists and winches will be available to enter and exit the plane for those with limited mobility like myself."

Mike Miller-Smith, Aerobility Chief Executive, said:

"Aerobility exists to make aviation accessible to all, whatever the disability, and our close partnership with Help for Heroes is effective in making participation in flying and aviation activities accessible to the wounded, injured and sick military community. Flying is not just great fun, but it also helps re-instill confidence and skills for those that participate.

"It is a privilege for Aerobility to support Alex in his flying goals. His enthusiasm is infectious and we look forward to working with him to bring accessible flying to Liverpool and the North West."

Bryn Parry, CEO and Co-founder of Help for Heroes said: "Help for Heroes is proud to be supporting Alex as he rebuilds his life beyond injury. We understand that no recovery journey follows the same path, which is why it so important that a holistic, individual approach to support is available. We are excited to follow Alex's progress with his flying and are committed to supporting him, and all those who have been injured in the line of duty, for life."

You can find out more on the charities websites:

www.helpforheroes.org.uk

www.aerobility.com

MODEL SHOW NEWS

Festival Of Flight Spectacular

Steve Bishop and the team behind the popular Weston Park Model Airshow will be holding a brand new model show at Ragley Hall, Alcester, Warwickshire on the 1st and 2nd of October, 2016

The two day model spectacular will include a fantastic night show on the Saturday evening and promises top model aircraft displays, generous trade support, on-site camping, as well as model boats, cars and all the usual R/C show attractions.

For more details please visit: **www.festivaloflight.uk** (sic)

Or phone Steve Bishop on 01952 587298 or mobile 07758 895068

Wings & Wheels Model Spectacular Reaches 30 Years!

Jane Stephenson, organiser of the highly popular Essex based model show, writes in with news of a milestone anniversary:

"We at Wings & Wheels Model Spectacular invite all modellers everywhere to join us in celebrating our 30th Annual Show at North Weald Airfield, Nr Epping, Essex CM16 6AR.

Not only is this a special anniversary for the show but the airfield celebrates 100 years, having been built during WW1. We are very fortunate to be able to hold our show on this iconic site.

Trade support for this show is massive and whatever your interest there is bound to be someone who can supply just about anything you need.

The Bring & Buy section of the show has grown dramatically. We now have modellers coming from all over the country to either sell their excess kit or snap up a bargain.

You will see everything R/C – boats (on a huge temporary boat pool and in the marquee), hovercraft, tanks, trucks, drones, Daleks and lots more!

There is a huge camping and caravan area where you can stay from Friday afternoon 24th June until early Monday 27th June.

Mega savings can be made by buying tickets in advance. See our website (www.wingsnwheels.net) and go to 'Buy Tickets Now'.

For further information regarding any aspect of the show please email us at admin@wingsnwheels.net or call 01242 604126.

See you there!"

Thanks, Jane. Wings & Wheels is a must-do event in our diary!

Woodspring Wings

Woodspring Wings Model Aircraft Club will again be holding its popular Annual Model Flying Show over the weekend of the 2nd and 3rd July at its airfield on Claverham Drove, north of Yatton. Access from the M5 will be well signposted and parking is free.

Building on the success of previous years the event will again include continuous displays by experienced international model show pilots flying single and multi-engine aircraft depicting aviation throughout the years, from early biplanes to modern jets with gas turbine engines. The show is complemented by the static displays and trade marquees that have been well received and enjoyed by thousands of visitors since the inaugural show in the early 1990's. The club will be running its popular raffle, with cash prizes for the winners to be drawn on Sunday, and a proportion of the proceeds from the show will go to supporting local charities.

In addition to the R/C model flying displays there will also be control line combat, and rockets boosted by members of the United Kingdom Rocketry Association (though the organisers do have to warn Bristol airport when they fire them!) Flying commences at 10.00 am and will continue uninterrupted until 5.00 pm.

The club flying site offers ample free parking for cars and caravans and is readily accessible for the less mobile. A food court provides sustenance throughout the day and a bar offers West Country ciders and beers. An extensive grassed area has views of the displays and gives a welcome opportunity to sit and relax. The club is looking forward to a repeat of last year's good weather, which will let the thousands of visitors have a really good time.**www.woodspringshow.co.uk**

RCMW Group Builds

Here at RC Model World magazine we are are keen to support and encourage as many model aircraft enthusiasts as we can to enjoy building their models from plans. Each month we publish an article describing a new or updated Feature Plan, which can be purchased from the Traplet Plans Service. And we also give away a copy of a free model aircraft plan in each and every issue with which you can start building your next model straight away.

Despite enjoying building and flying ARTF and foam models for their speed and ease of assembly, we strongly believe that there's little to beat the sheer pleasure and satisfaction that comes from building a model aeroplane from the building board upwards, starting with some balsa wood and a few ply parts.

To spread the word of this most enjoyable part of the modelling hobby we are pleased to introduce our RCMW Group Builds, which will give model clubs and associations a rising discount off a minimum of five or more sets for a Traplet Set of their choice. The more of your members that you can get to participate in an RCMW Group Build the bigger your discount will be (T's & C's apply, offer open to UK clubs and associations only).

Each Traplet Set contains the plan of your selected model, a laser cut wood pack of intricately shaped parts (no strip wood) and associated moulded parts, such as a canopy, cowl etc. **Call: 01684 588599**

STOL Model Project

Denis Sharp, who recently contributed a couple of articles on his aeromodelling exploits, has sent in details of another unorthodox model project:

"I've attached a photo of the latest design I'm working on, which you may find of interest (particularly if I get it to work!).

It's got an electric ducted fan arranged so its thrust can be vectored from directly rearward to nearly vertical. Not so much (at present) to give hovering flight but to give very short take-offs and landings. Hovering flight would need slightly more thrust than I've got available at the moment, and also a control system that works at zero speed (which is being worked on). Helicopters and drones can of course take-off and land vertically and hover but they have an inherent forward speed limit of just below half the speed of sound (thinks: I may need to buy a bigger battery!) when the tips of the advancing blades start to generate shock waves and the retreating blades don't generate any lift at all. Also, helicopters and drones are inherently inefficient in forward flight and are limited in range – no one has made a helicopter that can fly the Atlantic.

Attached is a 3/4 rear shot showing the thrust vectoring flap open (in horizontal flight mode). It only requires a surprisingly small servo to operate it and the linkage is arranged so that there is no load on the servo at either extreme of the flaps travel."

Many thanks for sending details of your latest project, Denis. Some of the lastest FPV racing drones are fast but I don't think any of those are quite reaching those sort of speeds – yet!

Quad Jet Inspiration

Tony Gower reports that after having been inspired by the recent Quad Jets article by John Stennard, he clothed his UDI U818A quad in some 3 mm Depron:

"I realised that with guards all round each prop it was easy to attach an additional body with four food bag ties. No problem on where to make lightening holes here!

The two bodies were maidened last night. I found that power was a bit of a problem – old batteries were quickly found out and I needed to fly on the higher of the two rates for any reasonable performance. Throttle management was easy – it needed 80-100% throughout! Duration also suffered by about 30%. The main problem, however was that anything other than smooth turns resulted in an irretrievably wobbly descent.

However, we thought the bodies looked good in the air and orientation was improved. And aside from the fact that aerobatics were right out they gave an extra dimension to the evening's flying. Great extra fun at negligible financial or time cost. Thanks, John for another great idea.

The fantasy land subjects mean that sadly they are not eligible for Scale Day. They are:

A) What a Chinese jump jet would look like if made and supplied to Bhutan. (Unlikely, and anyway Bhutan has no Air Force!)

B) A U.S. 1960s project to orbit 300 miles above the earth, ready to fire nuclear rockets. No, I wasn't aware of this earthly flying saucer either – until I looked for projects."

Dire Weather Build

Tony Harmsworth of the Minehead & District Model Club has put the recent spell of wet and windy weather to good use by building from a recent RCMW free pull-out plan. Tony writes:

"Weather so awful, with no flying possible. So I spent a week building DECAF. Two mini wing servos and a redundant .25 two-stroke. Now for the weather!"

Many thanks for sending us a picture of your DECAF, Tony. Hopefully by now you've had a chance to take advantage of the recently improved weather for a few test flights. As the old saying goes: If it looks right...

Diary Dates Work!

Michael Carter writes with proof, if any were needed, that inputting your club's event into our regular Diary Dates section works. Michael refers to the Bedworth Aeromodellers Swap Meet:

"Thank you for advertising our club's recent swap meet in Diary Dates. This was our first swap meet and it was very successful, raising much needed funds. The advert in RC Model World helped in bringing our swap meet to modellers' attentions, with one seller coming from 80 miles away."

You are very welcome, Michael. We look forward to being able to help promote your club's second swap meet when the time comes.

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The new CGO3+ camera gimbal with a Sony® sensor has 360° unlimited yaw. Combined with the retractable landing gear this allows for unobstructed views in any direction. The Typhoon H includes the Android® ST16 Ground Station, featuring an in-built 7" HD LCD touchscreen, displaying live footage in HD 720P.

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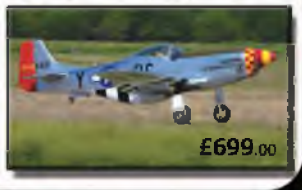

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www.flightpowerbatteries.com

ROBAN B 212 800-Size

Roban's new 212 is now available, the 14th product in their Super Scale series. Their new True Scale Design locates the cockpit exactly at the right spot, unlike some canopies based on 3D mechanics. The compact mechanics are built into the engine compartment, just like on a real helicopter. This allows space for front to back scale cockpit seats. The position light system is programmable with 9 different patterns and is preinstalled. The fuselage of the 212 stands out through the detailed crafted surface details and the overall correctly scaled down shape. The helicopter comes with a detailed instruction manual and the setup is simple and quick as the mechanics are completely preassembled and just need to be set up with the electronics. Only screw drivers and Allen keys are required to complete it. This scale helicopter comes with a complete set of scale mechanics!

www.quickuk.eu

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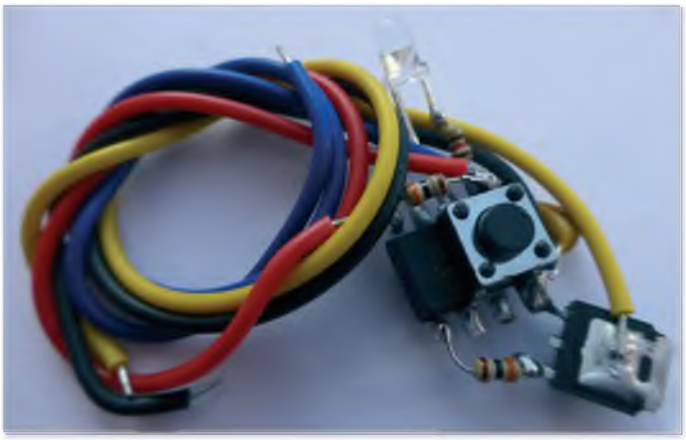
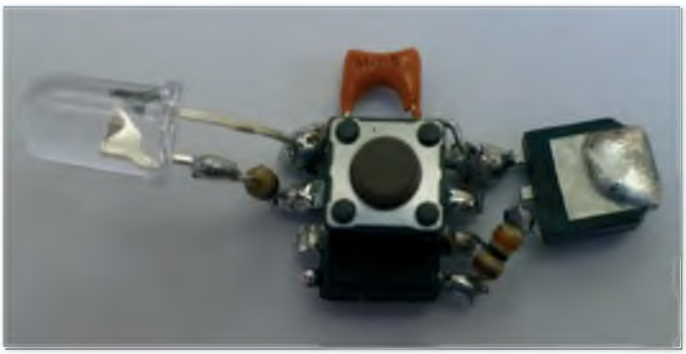
www.flightchip.co.uk





THERMY ARF

The award-winning model kit Thermy is now also available as an ARF, ready built and covered with genuine ORACOVER. The Thermy ARF has a wingspan of 2340 mm and a 4-flap main wing. The model is equipped with a V-tail which, along with the 2-piece wing, can be easily removed for transport. The suggested power set for Thermy is a PICHLER-BOOST 650-watt brushless motor and 3S LiPo battery, which is claimed will ensure a powerful, vertical climb.

www.pichler-modelbau.de

HACKER HMC-80 A CONTROLLER

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Seawind

Fly from land or water with this stylish amphibian by ST Models and distributed by Ripmax. Matt Boddington finds it a pleasure to build

Seawind looks good on land too!

I have to say that when the Seawind arrived for review I was unaware that it was actually modelled on a full-size aeroplane. The full-size is a high performance, four-seat amphibian manufactured in the USA and a striking looking machine it certainly is at 35 ft span and with its high-mounted 6-cylinder flat six engine.

The review kit is the latest offering from ST Models and is distributed by Ripmax Models. Just like the full-size the ST Models example is fully amphibious and is capable of being flown off grass, hard surfaces and, of course, water!

Supplied with seven servos, a powerful brushless outrunner motor, ESC, flaps, retracts, all pre-installed, the build time on this model is probably quite short! Each wingtip is moulded as a tip float and contains bright LED landing lights, flashing LED strobe lights and coloured LED navigation lights.

Moulded in tough EPO foam and at 1450 mm span, this looks to be a great and unusual model.

In The Box

The brightly coloured carton opens with a hinged lid, leaving a deep and narrow box. All the components are securely held within moulded foam. The parts are dominated by the large fuselage, complete with its big fin and rudder, and rear mounted engine. At the front end is large hinged canopy and retracting nose wheel, complete with flush fitting doors to seal the hull for those water landings. The hull also has a plastic finish to help with water operations.

The two wing panels come complete with ailerons, fowler flaps and aileron servos installed. Also in the box are the tailplane, complete with the elevator and a small upper fin. The parts are completed with a bag of accessories and screws, the main landing gear, prop and spinner. The brightly coloured decals are pre-fitted to the model.

Putting It Together

As mentioned earlier the parts count is really quite low so it should not take too long to put the Seawind together.

The first job is to secure the main landing gear. The retract mechanism is installed in the fuselage and the Dural landing gear is screwed to it with self-tappers. The legs are handed and according to the instructions they should be marked L and R, but the items in the review kit were not marked. However, the legs can easily be identified as the mounting faces are tapered, being slightly thicker at the forward edge. Both main units and the nose legs are sprung loaded and have a nice firm feel to them. The main spring loaded oleo is attached to the retract mechanism by one screw.

The tailplane attaches to the rear plastic moulding by clicking it in at the L/E and it is then held by a single screw at the rear. Before clicking in at the front you need to feed the elevator pushrod through the connector on the elevator horn. The small upper fin then simply slides in and clicks into place.

The two wing panels are located on a carbon rod that passes through the fuselage. When sliding the panels into place you must also pass the aileron servo and light leads through the correct hole and into the cabin. You also need to locate the wire flap pushrod through the hole in the fuselage side and locate it into the EZ link on the servo arm of the flap servo located on the rear bulkhead of the cabin. This is a little tricky and needs some care.

When tightening up the flap pushrod connection make sure that the flap servo is in the correct position and the flaps are both up. I did wonder at this point why there is a single central flap servo and not one in each wing?

Now back to the wings; when they are pushed home against the fuselage they are retained by two simple clips that rotate through 90 degrees and lock the wings in place.

As mentioned before access to the servos and the radio bay is through the forward cabin that lifts up on two scale rams that allow the cockpit hatch to be locked in the up position for easy access. Inside, the front and rear seats are held in place by magnets and simply lift out. Under the front seats is the location for the LiPo battery in the form of a Velcro strip and a retaining strap.

I located the receiver at the rear of the cabin and tidied the mass of wires as best I could.

The seats are of the same EPO foam as the rest of the aircraft and with them back in place it all looked very white! I took the opportunity to paint them in a nice shade of blue to match the livery of the aeroplane. I also painted the cockpit coaming black to add a little more scale feel. I used Tamiya Acrylic spray paint for this, which I find works really well.

To finish off, the supplied prop is fitted to the brushless motor and topped off by a

Sturdy main undercarriage mount

Screwing the main legs in place. The shock absorber is yet to be attached to the top mounting point

The nosewheel has a good level of scale detail

An early noseleg collapse was traced to the actuating pushrod having no means of retention. It was easily fixed by adding a swing keeper

The tailplane is retained using a single screw at the rear of the tailplane mount. Elevator connection is via an EZ link – be sure the screw is nipped up tight!

The upper fin is keyed in place with a slotted moulding

Wing panels are joined using a carbon rod. The aileron and light leads pass through a hole into the cabin. The wire flap pushrod goes through another hole and connects to the flap servo located on the rear bulkhead of the cabin

Turning two twist locks by 90 degrees clamps the wings panels firmly in place

The radio gear and LiPo sit under the seat moulding, which is attached with four small magnets

Swing stays lock the canopy open when accessing the radio and battery bay

The brushless motor mount will be familiar to those of you who have built an ST Model before

The seats were painted blue to add a bit of colour to the bare white cockpit

spinner. I painted the spinner to add some colour, again using Tamiya Acrylic.

Setting Up

With the battery fitted in the nose the C of G worked out as per the instructions and it certainly felt about right.

The control surfaces were set up as per the movements in the instructions, apart from the flaps. These are only given as 20 degrees in the instructions and I set two positions of 10 and 20 degrees for take-off and landing. All that was left to do now was wait for a suitable day for a first flight.

Flight Test

Well finally a day arrived when everything fell into place - no wind and plenty of sunshine and blue sky!

With a fully charged battery and everything checked we were ready for the first flight.

The initial plan was to fly from the grass so we could get some airborne pics but when we arrived at the flying site we had an added bonus; the adverse weather that had prevented us flying for so long had given us a very large puddle, certainly big enough to taxi around in and quite possibly big enough to take-off on.

After a few pics taken on the water we went for a take-off. I pulled her back as far as I could get, set a stage of flap and opened the throttle. A quick acceleration followed and she was soon on the step and then airborne, with room to spare!

She was straight into a positive climb and I put the flap away. A few moments to settle down and I was almost instantly at ease with the Seawind.

Sometimes you just know that a model is flying well and the Seawind was certainly flying very nicely. I was soon happy for some lower passes for the camera and then it was time to drop the gear and the flaps to see how she performed at slow speed. The first thing to notice was that there was very little, if any pitch change when the flaps were deployed. And with the gear down she was very well behaved indeed.

A few passes for the camera and it was noticed that the nose gear did not look to be fully locked down. So I cycled the gear a few times but it seemed to make no difference. I also noticed that with the gear up the water rudder was not fully lowered - possibly a related problem?

I put the gear away and climbed away to see what else the Seawind could do. Putting power on produces a very slight pitch nose down, most likely due to the high thrust line. This is only very slight and it is very predictable and very controllable so is no real problem.

With some height in hand some loops and rolls were tried out. There was more than enough power for big loops and the rolls were sedate and scale-like with plenty of elevator authority to keep the nose up. A few more low passes followed - not really for pics but just because I was enjoying myself too much!

Due to the issue with the nose gear it was decided to land the Seawind on the grass with the gear up. Besides there was not really enough room on the puddle for a landing! With flaps down, the Seawind was nice and stable on the approach, prior to a smooth touchdown on the grass.

An investigation of the nose gear found that the pushrods from the nose leg and the water rudder go through the same EZ link on the servo and had slipped, possibly due to the water rudder hitting the bottom of the puddle on those initial taxying trials!

With the gear adjusted they functioned fine and later in the day I flew again using the undercarriage and off the paved surface. This time on landing the nose gear collapsed! Investigation under the plastic cover on the nose found that the operating pushrod had come out of the actuating horn. The end of the pushrod was just bent at 90 degrees and there was no means of holding it in. I refitted it in no time and solved the problem by fitting a keeper from the spares box.

Summing Up

Well what a great model! I have to say I was unsure at first as it looks very unusual indeed. However, the build went very well and was a pleasure - not always the case, I must add!

The flying characteristics are superb, with a light wing loading and exemplary behaviour. I couldn't wait to fly it again. I look forward to having great fun splashing around in a bit more water!

RCMW

Coninued overleaf

Atmospheric evening shot at a local airfield. Static and flying shots courtesy of Tony van Geffen

Loading up a 3S LiPo prior to the maiden flight

Final checks before committing the Seawind to the water for the first time

All looks well during flotation checks

Lining up for take-off

Up and away, straight into a positive climb

Underside view showing the clean lines when the undercarriage is tucked away

There's more than enough power for big loops and rolls are sedate and scale-like

Sometimes you just know that a model is flying well

With flaps down Seawind is nice and stable on the approach

RC MODEL WORLD

MODEL INFORMATION

NAME:	Seawind
MANUFACTURER:	ST Models
DISTRIBUTOR:	Ripmax
WEBSITE:	www.ripmax.com/Item.aspx?ItemID=A-STM180
PRICE UK:	£184.99 SSP
MODEL TYPE:	Semi-scale amphibian
MOTOR:	Brushless
LIPO:	3S 2100-2500 mAh 30C (not supplied)
CONSTRUCTION:	Moulded foam

R/C FUNCTIONS

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

SPECIFICATIONS

WINGSPAN:	1450 mm
WING AREA:	27.74 dm sq
LENGTH:	1123 mm
TARGET WEIGHT:	1820 g

Dislikes

Lack of keeper on nose gear pushrod

Likes

Everything - flying, build, everything!

New AXi v2 motors

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CL-84 Dynavert

Is it a plane? Is it a drone? Actually it's both, as Andrew James discovered when he put together Flyzone's amazing tilt-wing aircraft

The Dynavert is an eye-catching model whether hovering or in forward flight

This interesting model encompasses several recent developments in radio control equipment. Specifically, the brushless motor mixing technology that is commonly used in R/C drones, combined with 3-axis gyro stabilisation that is now fitted to many model aircraft – drones and planes alike. Based on the Canadair CL-84 'Dynavert' experimental aircraft, it is able to take-off vertically like a helicopter or drone and then transition into forward flight where it flies like a standard R/C aeroplane.

Due to the unusual nature of this aircraft, this is one model where a thorough read through of the multilingual instruction manual is highly recommended. Printed in black and white, it contains step-by-step pictures to guide you through the assembly. It is all very straightforward but it is the connecting up of the additional 'electronic board' that requires additional attention, as well as a good understanding of what to expect when flying the model for the first time, especially when transiting to and from straight and level flight.

The instructions call for 'a certain level of model flying expertise' to be able to fly the CL-84 and having done so I would say that you should be a competent fixed wing pilot and have a good level of outdoor drone and/or helicopter flying experience too. Having said this, the CL-84 is not a difficult model to fly and should be within the capabilities of most competent club level pilots.

About The '84'

The CL-84 'Dynavert' was a V/STOL aircraft developed by Canadair between 1964 and 1972. Only four aircraft were built and two crashed due to mechanical failures. Despite this the CL-84 proved a success in flight trials but it did not enter production.

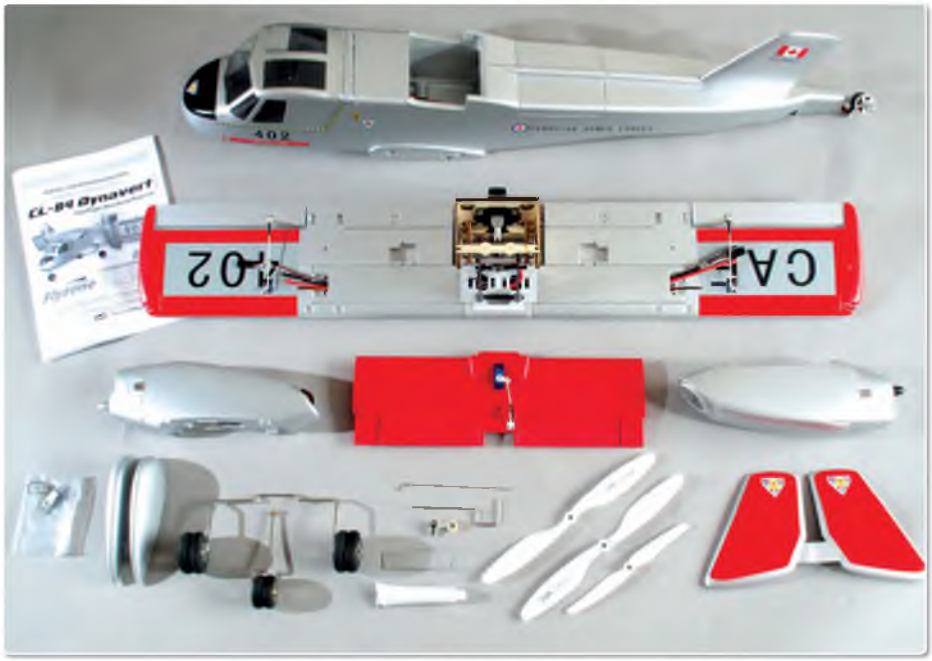
The wing and engines were tilted by a hydro-mechanical ball actuator, changing the wing incidence by 100 degrees between normal flight and VTOL settings. Vertical contra-rotating propellers in the tail provided pitch control during hovering and transitional flight, which is emulated by single propeller at the rear of the model. A mechanical mixer was used to adjust the controls during the various flight modes and the flaps/ailerons gave yaw control when hovering. Wing tilt was the only unfamiliar control for fixed wing pilots, this being controlled by a switch on the throttle lever.

The Lycoming engines were interconnected by cross shafts so that if one failed it would automatically disconnect and both rotors would be driven by the remaining engine. In the hover moving the throttle lever caused pitch adjustment of the rotor blades, as per collective pitch control of a helicopter.

Long Thin Box

The colourful box opens to reveal a surprisingly small number of factory finished parts, all well protected from the rigours of shipping. As with most moulded foam models these days the airframe parts are fitted with servos, which are linked up to their respective control surfaces. The rotary shaft that controls the direction of the rear 'pitch' motor is also fitted and just requires linking to its servo with two short wire pushrods.

Naturally, one's eye is drawn quickly to the wing tilt mechanism that is built onto the centre section of the wing. At first glance this looks to be a bit of a Heath Robinson affair,



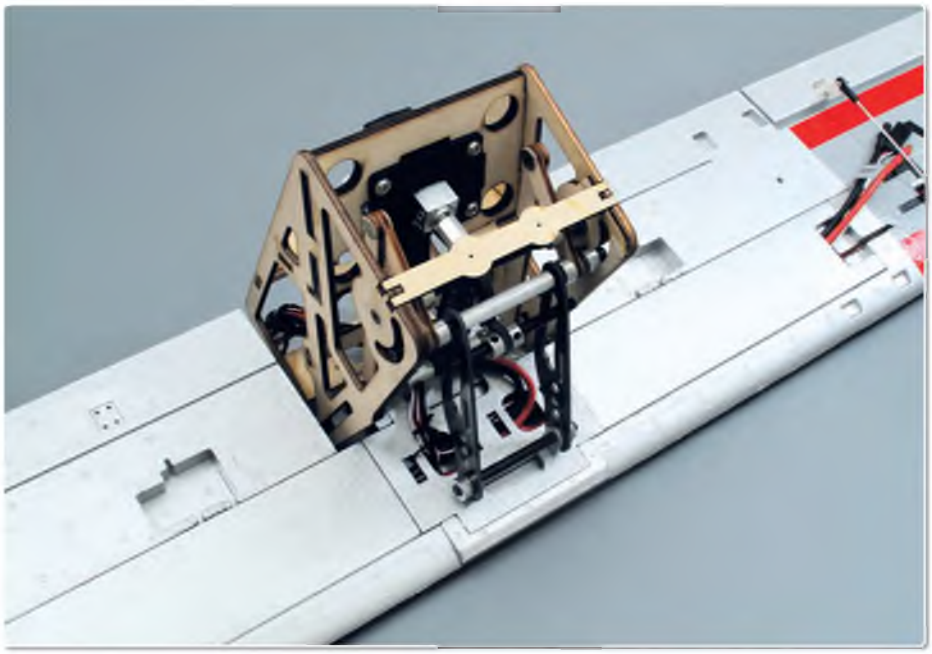
Parts count is relatively low due to the amount of work already completed at the factory

being loosely constructed from a mixture of laser cut ply and carbon fibre parts, interconnected by carbon rods, aluminium tubes and collets. However, it's important to resist the temptation to tidy and tighten things up as I found it to work perfectly once it was installed deep inside the fuselage, where the built-in flexibility helps prevent any binding as the wing is hauled into position by what looks to be an adapted electric retract mechanism.

Choose Your Undercarriage

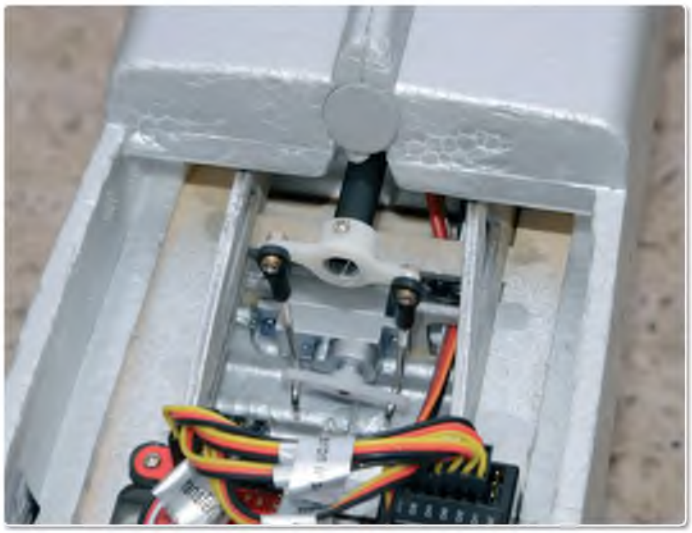
Each undercarriage leg is fitted with double wheels, as per the full size. The n-shaped main legs are simply clamped into place after locating the central wire in a slot on the underside of the fuselage. Attention then turns to the noseleg, for which both fixed and steerable versions are supplied. Since I only envisaged performing vertical take-offs, I fitted the fixed version.

If you want to take advantage of nosewheel steering then you will need to supply an additional micro servo; the only note of caution I would add is that the CL-84 is quite a power hungry model so any taxying around on short grass or tarmac is probably best left



The wing tilt mechanism is attached to the bottom of the wing. Note the cutouts for flap servos, which are not mentioned in the instructions but could easily be fitted

Wing tilt is performed by this actuator, which looks similar to an electronic retract



Two short pushrods need to be popped onto the ball links fitted to the rear motor control shaft

The ball links were very stiff so I used a nut as a protective sleeve and a pair of pliers to add the necessary pressure

Tilt box in place after clearing out some blobs of glue from inside the fuselage

Linking up the electronic board is easy as all the leads are clearly labelled

Plenty of room in the nose for the 4S LiPo

Two cocktail sticks were used to add support when gluing the central fin in place

Foam 2 Foam glue was used instead of epoxy to glue on additional foam parts, like the undercarriage fairings

The rear motor tilts on a shaft to yaw the model and changes in thrust control pitch in the hover

Underside view of the rear motor mount and shaft

until after you have flown, when the battery will not be required to fly the model. It is sure to look good doing this though!

Wing Installation

The instructions are quite comprehensive regarding the insertion of the wing tilt frame into the fuselage. Special attention needs to be paid to making sure that the numerous extension leads are correctly routed so that they are kept well away from any moving parts. Despite the best intentions of the manual, I still managed to get it wrong and a couple of attempts were necessary to make sure that the wiring harness was safely stowed.

With this done the wing tilt frame should slide snugly into place into a matching box moulded into the middle of the fuselage. However, I couldn't get the tilt box to slide down by more than a few centimetres. After a few attempts I became concerned that my efforts were bruising the external panels of the fuselage, particularly the one immediately behind the tilt box, so I withdrew the mechanism for a close look.

It was immediately apparent that some dribbles of the glue used at the factory to attach a pair of internal ply formers were stopping the tilt box from being inserted properly. The offending lumps of glue were easily removed and I tried again. This time the tilt box went in without any problems, where it was secured with a pair of wood screws to the aforementioned ply formers, front and rear.

At this stage the hinged top hatch that covers the tilt mechanism in forward flight is meant to be glued in place. But since I was yet to activate the wing-tilt I decided to leave this until the mechanism had been tested.

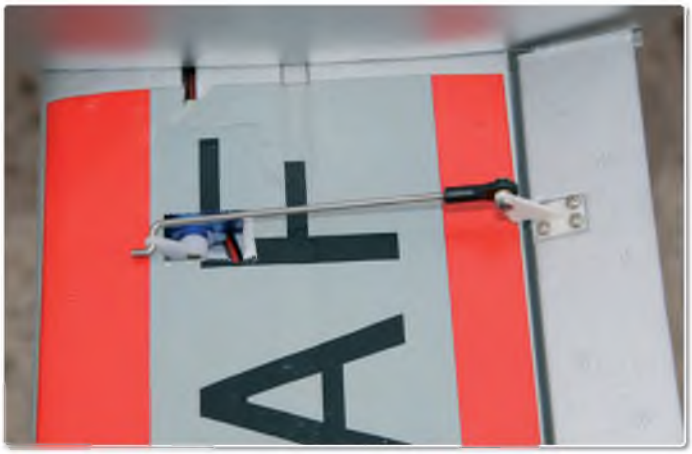
The final job on the wing is to attach the two motor nacelles, or pods, as they are referred to in the instructions. After connecting up the power and ESC wires, and feeding them carefully into the wing, each pod was secured with a pair of 35 mm long bolts.

Tail Assembly

The CL-84 has three vertical fins but none of them are fitted with a rudder, yaw control being made by tilting the rear mounted motor. The outer fins are supplied as a pair that are still joined by a piece of foam. This needs to be cut away with a sharp knife before attaching the fins to either end of the tailplane. The instructions recommend epoxy for this job but I have had good results with foam joints using 'Foam 2 Foam' glue from Deluxe Materials, so I used this instead.

Having completely rebuilt the front end of a medium size model with this adhesive, motor and all, I knew it had high strength but it remains slightly flexible, which will be handy to soak up any bumps and scrapes when transporting the Dynavert to the flying field.

The elevator linkage was moved down a hole on the horn to increase the control throw



Aileron servos are pre-connected and were found to be well centred and giving the correct throws

Tilt wing sequence

With the wing level the CL-84 converts to a conventional fixed wing aeroplane

Ideally you would want to use some form of square to make sure that each fin was glued on vertically. But they are curved slightly inward, which makes setting them up quite tricky. In the end I just relied on the good old 'Mark 1 Eyeball' to square them up as best I could.

After connecting up the factory fitted elevator servo the tailplane was located on its mount and secured with a single screw. (Later, when the wing tilt was operational, I checked the wing/tail alignment from the rear and saw that the tailplane was slightly off. A thin piece of card was inserted between the mount and the tailplane on the low side to pack it up level with the wing trailing edge.)

The central fin can now be fitted. While the end fins are secured using quite deep recesses, the middle one sits in a fairly shallow slot in the rear fuselage. To help stop it getting knocked loose I inserted a couple of cocktail sticks as internal supports and again used 'Foam 2 Foam' glue to hold it in place. A couple of days later I stood the model on its nose and when I returned I found it upside down on the floor; the top of the middle fin had taken the brunt of the impact as the model toppled over but it had held fast so my fixing method had worked as intended.

The final assembly task is to fit the main gear fairings. As with the outer fins these two wing shaped mouldings come linked by a piece of foam. After cutting them loose they were glued in place on the side of the fuselage, just above the main wheels.

Electronic Board

The heart of this model is the 'Electronic Board' that takes inputs from the receiver channels and outputs them with 3-axis stabilisation. It also splits the throttle channel into outputs for the right and left hand motors and mixes in the rear motor. The long leads that feed through from the wing tilt mechanism are connected to the bank of output pins while short extension leads connect the receiver channels to the input side of the board. All the leads are supplied and are clearly marked to show which pins on the board they need to be connected to.

As this is a Hobbico product I decided to use my trusty Tactic six channel transmitter. The Tactic TTX650 radio set comes with a TR624 receiver with a single short aerial. The CL-84 instructions recommend the twin aerial TR625, which the Editor kindly arranged for Hobbico in the UK to supply for this review. Initial hovering trials were conducted with the TR624 while I waited for the TR625 to arrive and I am sure it would have worked fine in aeroplane mode. Still, I wasn't about to turn down the chance of using the TR625 when it was offered to me! Of course, any good quality radio system could also be used.

Clear illustrations in the manual also help with the set-up of the board, as well as showing control responses for stick modes 1 and 2. Further easy to follow instructions are provided to allow you to calibrate the electronic board and to check that the 3-axis gyro is working correctly.

Arming the motors is also described, by selecting low throttle and holding the rudder stick to the right until the nav lights on the wingtips light up. The same process is meant to disarm the motors but on our example left rudder is required to do this.

A final word on the electronic board, which also features reverse switches. This, combined with the fact that the controls need to be set to 100%, means that a basic five channel radio is all that is needed to fly the CL-84.

The control throws were then checked against the manual. Both ailerons were found to be well centred and bang on the deflections listed. The elevator was also well centred but it did not have enough throw, so a different hole was used on the control horn to get it closer to the range specified. The throws look quite extreme but previous experience with gyro stabilised set-ups has taught me to put my faith in the electronics. (As expected the controls proved to be well adjusted in flight.)

The propellers can then be fitted, taking note of the right and left labels, after which the Centre of Gravity can be checked. With the recommended 4S 2200 mAh LiPo placed as far forward as it would go in the large battery bay underneath the main canopy the CL-84 balanced as per the book. To stop it from sliding around I fitted patches of self-adhesive Velcro to the battery bay floor, taking care not to obscure the large cooling hole in the middle.

Flying The CL-84

Having flown a small Silverlit tilt-wing model I was not surprised to find that hovering the CL-84 in anything above a slight breeze results in the wing catching the wind like a big sail. So for the first few hops I made sure that it was placed well in front of me so that it had plenty of room to drift back while I became accustomed to the controls.

In VTOL mode the CL-84 flies much like a large drone, albeit a tricopter. In some ways it is more akin to a slightly sensitive R/C helicopter, hence the need for some appropriate flying skills. As I said before it is not difficult to fly, but it will keep you on your toes!

Over the course of a couple of batteries I also found that the model was much more sensitive when in ground effect, so once you have got the hang of things close to the ground it pays to 'man up' and push her upwards into a high hover. Provided the wind is not too high things will settle down and the Dynavert becomes a lot more stable to fly.

If you choose to fly in anything above a gentle breeze then be prepared to push the nose down quite a bit to maintain the model's position.

At this stage I handed the CL-84 over to the Editor so that he could take some flying shots and also test the transition and aeroplane stages of flight.

My Turn!

Heeding Andrew's advice to fly on calmer days we selected a rare sunny spring day for the photo session. Hovering the CL-84 was exactly as mentioned above, so I had no surprises there. So there was nothing left to do but to find the wing tilt switch and go for forward flight!

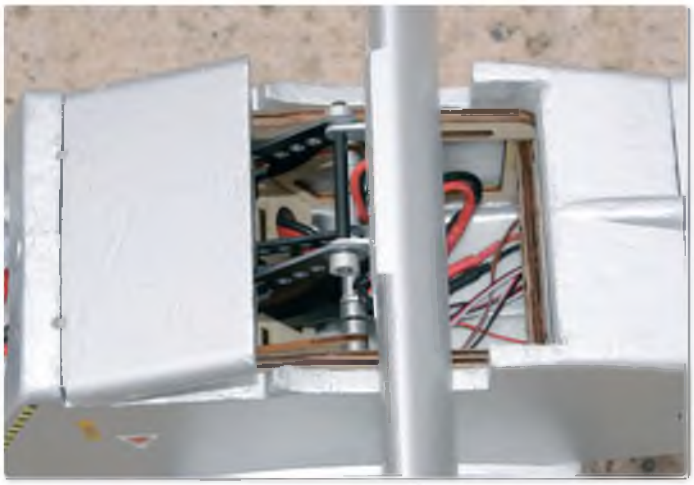
Once the plane was in a steady hover at just over head height the switch was flicked and the CL-84 started to move forwards as the big props began to bite the air. Some throttle was applied as she gained airspeed to prevent her from dipping too much during the transition, but very soon the wing was level and she was off and moving forwards with quite a surprising turn of speed. Despite the large throws the 3-axis stabilisation system was working well and the Dynavert proved easy to handle.

At the out of the box settings there is not enough movement for safe aerobatics and both rolls and loops were aborted before they really got started. I had the feeling that with no additional throws in reserve the model would be in trouble if it ever became inverted. But, hey, I doubt if the full size was ever intended to perform aerobatics either, so I was not bothered by her preference for staying on an even keel. The instructions caution to *'keep in mind that this model needs a lot of space and can't make sharp manoeuvres like an aerobatic model'* and this accurately sums up its flying style.

After a few more speedy circuits and camera passes I decided to bring her in for a battery check at just over four minutes on the flight timer. Good job I did as the budget battery that I was using was showing just over 20% capacity remaining, so stretching it to the five minutes originally set on the Tactic 6 would have been a bit tricky.

Another battery of the same type gave a similar result, but a 'quality' pack had much more in reserve, so you'll need to monitor this carefully when flying your own CL-84. Just don't push it too far as I don't think the chubby airframe would glide too well...

Back to my first flight, I slowed the CL-84 down as she motored around the circuit and then popped the tilt switch as she passed over the strip. The instructions warn that the model may bank in both the roll and pitch axes, resulting in a bit of a wobble, but this is only a transitory state as the airflow diminishes over the wing and tail, and while the gyro stabilises. Sure enough our Dynavert began a bit of a jig but she soon snapped out of it and resumed a high hover. In fact it was not nearly so bad as I had expected and I landed the CL-84 with a huge grin. This model obviously comes with a large dose of fun factor built-in!



The hinged front hatch was glued in place after the wing tilt was tested

Looking for something interesting to fly?

On a calm day the CL-84 will hover nice and level

The rear motor tilts to yaw the model

My son, James was acting as photographer for this session. He is a much better pilot than I am, especially with drones and helicopters, so I let him have the next flight to see what he thought. Unlike me (thumbs on top of the sticks) he was taught to fly R/C helicopters by some top heli pilots so he holds the sticks between his thumb and forefinger, which he finds gives him finer control. After noting my initial wobbles in ground effect he pushed the CL-84 straight into a high hover and held it steady while I rattled off a few frames. He then flicked to aircraft mode and flew a few circuits, but at a much slower speed than I had managed, which proves that the Dynavert does posses quite a decent speed range. He was therefore able to slow the model down much better for the transition back to the hover, but by this time the wind had risen a fair bit and the sprightly model led him a bit of a dance whilst he waited for the gyros to kick in and stabilise it for landing.

Overall we thoroughly enjoyed flying the CL-84 Dynavert. It certainly spices up a flying session, despite not being an aerobatic type. The field we were flying from is prone to getting very soggy over the winter and a VTOL model like this one could be just the answer for those 'wet field blues', enabling you to take-off vertically from a dry spot and still enjoy a spot of fixed wing flying while other models remain grounded in the mud!

RCMW

Wing tilt in flight

RC MODEL WORLD

MODEL INFORMATION

NAME:	CL-84 Dynavert Rx-R (receiver ready)
MANUFACTURER:	Flyzone
DISTRIBUTOR:	Hobbico in the UK
WEBSITE:	www.hobbico.de (search for Dynavert)
PRICE:	£276.99
MODEL TYPE:	Semi-scale twin tilt-wing
CONSTRUCTION:	Moulded from Rx-R AeroCell foam
PARTS SUPPLIED:	Airframe, brushless motors and ESC's, electronic control board and all hardware
PARTS REQUIRED:	5-channel minimum transmitter and receiver, 4S 2200 mAh LiPo

R/C FUNCTIONS

1. Throttle
2. Ailerons
3. Elevator
4. Rudder/Rear Motor Tilt
5. Wing Tilt

SPECIFICATIONS

WINGSPAN:	950 mm (37.4 in)
LENGTH:	1050 mm (41.3 in)
WEIGHT:	1700 g (60 oz)

Dislikes

Excess glue inside fuselage preventing seating of tilt box

Likes

Easy assembly • Eye-catching model • Fun to fly in hovering and forward flight • 3-axis stabilisation works very well

Time for the Editor to have a turn! In stronger winds the nose has to be pushed down to maintain forward movement

Dynavert is more stable when hovered higher, out of ground effect

Dynavert has quite a turn of speed. Note how the rear motor stops in forward flight

Fixed wing flying is easy thanks to the 3-axis stabilisation but it needs plenty of room for wide turns

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Aerolab LoCamp

Peter Miller has thoughtfully rescaled this 'docile to fly' tandem seat American home-build tourer to 1:6 scale, giving a wingspan of 1520 mm wingspan for .40 – .52 cu in four-stroke engines and five-function R/C

LoCamp's wing incorporates slotted flaps and Frise ailerons

MODEL WORLD

At A Glance

MODEL TYPE:	Civil, 1:6 scale
WINGSPAN:	60 in (1520 mm)
WEIGHT:	89 oz (2523 g)
WING AREA:	600 (3857 sq cm)
WING LOADING:	20 oz/sq ft (65 g/dm^2)
LENGTH:	44 in (1117 mm)
RADIO FUNCTIONS:	Throttle, Ailerons, Elevator, Rudder, Flaps
RECEIVER:	Hitec Optima 7
SERVOS:	Hitec HS311 and Tower Pro MG90S
BASIC MATERIALS:	Balsa, Ply, Spruce, etc.
COVERING MATERIAL:	Solarfim Supershrink Polyester
C OF G:	2 5/8" (66 mm) from Leading Edge
ENGINE RANGE:	48. – .52 cu in (7.8 cc – 8.52 cc) four-stroke
ENGINE USED:	OS FS48 Surpass
PROP:	11" x 6" black glass-filled nylon

Researching The Subject

The Aerolab LoCamp was designed by Francesco Rizzi, an Italian airline pilot, about 15 years ago. He built his own aircraft in Italy. Aerolab USA has taken on marketing the very complete kit in the USA.

I found colour three-view drawings some years ago and the aircraft appealed to me. But, as with so many projects, it lay in the 'inspiration' file until one day I decided to build it.

From the Aerolab USA website I was able to download the complete 560 page assembly manual free of charge. This website also has a large selection of photos of the aircraft under construction, plus some of it at various airshows.

Francesco Rizzi very kindly supplied superb three-view drawings. He also supplied drawings of the projected parasol wing and biplane versions. The aircraft is designed to look like a 1930s light plane with cantilever wings and fabric covering.

The wing incorporates slotted flaps and Frise ailerons. It is powered by a 110 hp Rotec seven-cylinder radial engine that is made in Australia. As a side note, look up images of the Rotec 2800 on Google and you will be amazed at the number of motorcycles powered by this 31" diameter monster.

The Model

The aircraft appealed to me because it was basically very simple – just the sort of model that I like.

The wing is 16% thick and almost flat-bottomed. Add to that the fact that it is set at 3 degrees and I did wonder at how the model would handle. I decided to use the scale ailerons and flaps, which added considerably

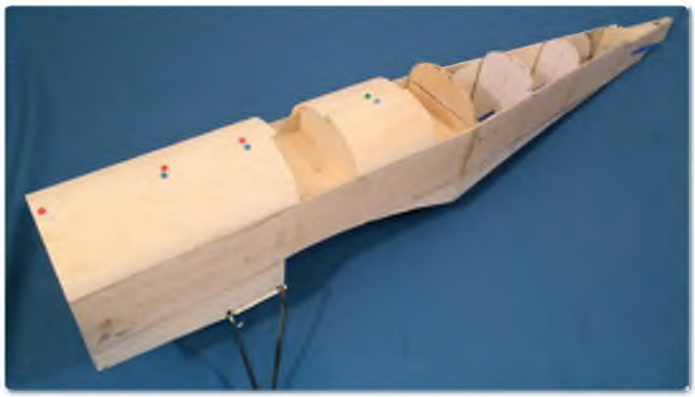
The basic fuselage assembly. Note sloping cockpit floor and internal box to support tank

Detailed view of tank support box. Note triangular stock in corners

The undercarriage is bolted to the ply formers with brass 'P' clips that are soldered to the wire after bolting them in place

The bottom of the U/C legs are joined by wrapping with brass sheet and filling them with solder

Spines fitted ready for top sheeting



Rolled top sheet applied. Wet it and use a heat gun to shape it

to the complications. The hinging and controls are fiddly to say the least but I have worked out all the bugs for future builders, which will reduce but not eliminate the muttered curses.

I also wanted to do a detailed engine as this is such a prominent feature of the aircraft. That added even more complications. However, I feel that both these features were well worth the effort. The construction of the engine has been described in a separate article in the January 2016 issue of RCMW (but please ignore the article's title! – KC), as much of the technique can be applied to other dummy engines.

I chose to use an OS FS 48 Surpass. You could use a .52 four-stroke. The model has a wing area of over 600 square inches and ended up weighing 5 lb 9 oz, which gave a most civilised wing loading of 20 oz per square foot.

I have to confess that I made a bit of a pig's ear of the colour scheme, getting the radius of the scallops wrong. So I omitted the pin striping behind them.

Flying The Model

Amazingly, the Sunday after the model was completed turned out to be almost perfect, although the breeze was a little stronger than I like for test flying. However, with the weather that we experienced last year I knew it could be months before we got another perfect day.

The take-off was smooth and very scale-like. This model is very docile. I found that I needed a few clicks of left aileron to get the trim right.

After flying round to get the feel of the model I was ready to find out what the aerobatic performance was like. Bear in mind that the aircraft is not designed for aerobatics.

Loops are quite easy, as one might expect with the rigging layout. Rolls tend to be very barrely. I expect that with a lot of work one could make them more axial.

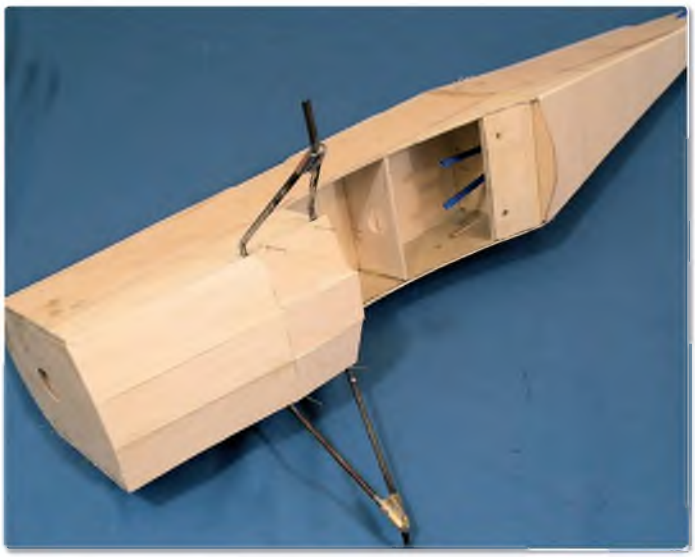
I was certain that inverted was going to be tricky and I was right; the model started diving as soon as it was upside down, but high rates and full down elevator did allow the model to fly inverted quite nicely.

The model does excel in one manoeuvre. It does the best stall turns that I have seen in many a long year. Pull up, throttle right back, and as the model stops hit full rudder, and she just turns in her own length. If there is a hint of aileron she will screw out on the way down but with care that can be avoided.

The flaps are interesting. There is no trim change as they come down. You can't even tell that they are down except that the model slows down! The main problem is that even on tick-over, with the flaps fully down, the model will not come down, it just stays at the same altitude and it is necessary to raise the flaps to come down and land.

Once one is committed to land the model does tend to float in any breeze. But landings are smooth with little or no bounce due to the rather rigid undercarriage. It has been found that with the flaps fully down the model is more stable in breezy conditions.

Two landings were short, into a field that had been cultivated and even these were quite smooth. These were due to the engine dying on the approach.

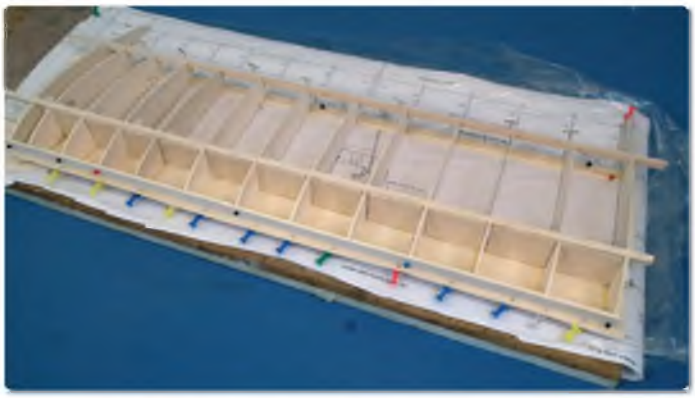


Underside sheeted and wing bolt nut plate fitted

The stringers are fitted. Leave over length at the rear for final trimming

The front of the fuselage is made up from two laminations of 1/2" sheet and shaped to a smooth rounded contour

Basic wing construction is simple to build



Lower sheet glued to LE and webs fitted. The rear spar needs to be webbed as well

Top sheet applied to leading edge

This is a nice relaxing model to fly. I would describe it as a low wing Piper Cub in terms of handling and flying.

Building The Model

Construction is pretty simple for most of the model. However it does get quite complicated for the flaps and ailerons, and their hinging. I shall concentrate on the trickier areas and just give a basic sequence for the rest of the build.

Fuselage

This is the usual sequence of gluing the plywood doublers to the sides and then joining the sides with the first five formers. Add the cockpit floor to keep everything square. Note that the front of the floor slopes up. This is to allow the fuel tank to be inserted and removed. The tank support compartment is also fitted now.

The balsa sides are cut partly through, level with the rear face of F-5, and then cracked and pulled in at the rear and the remaining formers added.

The undercarriage has to be fitted at this stage. This is held to the formers with 1/32" brass 'P' clips bolted to the formers. The bottom of the legs are joined by wrapping with 1/32" brass sheet and filling them with solder. This is far neater and easier than binding with wire. At a later stage the top wire will be added while the remaining detail is added after covering.

The tops of the formers and 1/4" square spines are added before covering the top of the fuselage with rolled sheet.

The fuselage bottom is covered with 3/32" sheet at the front and 1/16" sheet behind the wing after installing the snakes.

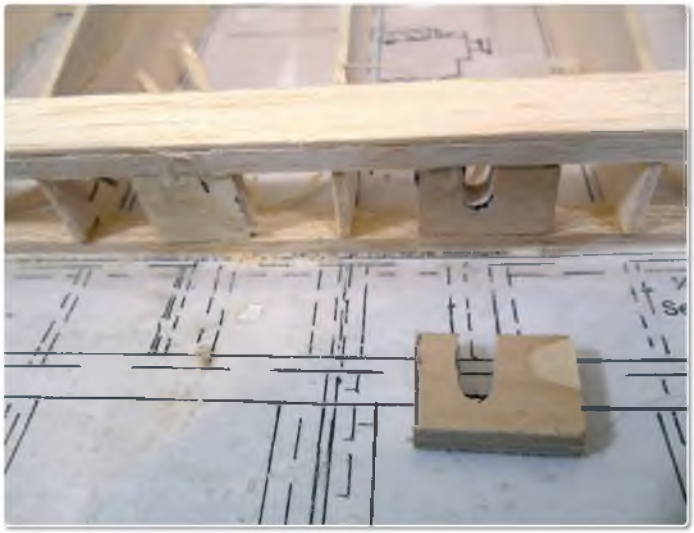
Fit the tailplane platform and the tail wheel mount. Also make and fit the 1/8" ply nut plate for the wing hold down bolts. The stringers are made from 1/8" x 3/16" spruce and can be fitted now. Leave them over long at the rear to allow for final trimming late. Add the sheet infill at the front. The headrest is added after covering.

The front of the fuselage is made from laminations of 1/2" sheet, which is carved and sanded to shape when the glue has dried.

This takes care of the basic fuselage.

Building The Wings

Start off by laying down the lower leading edge sheet and the rear spar cap-strip.



1/4" ply hinge mounts, with slots for the pushrods where the servos go

The wings being joined. Both leading edges can be covered with sheet before joining, using clamps and map pins to hold the sheet down

Close up view of flap

Fitting the ribs at the hinge points. Note use of rectangular brass tube for accurate spacing

Glue balsa sheet to the leading edge and allow to dry before being bent over with the aid of water and a heat gun

Roll supported balsa to form the sheet for the tips, ready to be cut to shape

Then glue down the lower main spar and lower rear spar.

Next glue on the ribs. Do not fit R-1 at this stage. R-1-a is glued to R-1b before assembly. This rib must be fitted at an angle using the template provided.

Do not glue the ribs to the leading edge sheet at this stage. Add the top main spar and rear spar.

Glue on the 1/8" sheet leading edge and fit the webs to the spars. Note do not web the rear spar in the rib bays where the pushrods go through. When the glue has dried raise the leading edge sheet and glue to the leading edge with Aliphatic resin, then apply Superphatic along each rib.

Fit the 1/4" ply hinge mounts into the rear spar. Make sure that the cut outs for the pushrods will allow a normal 2 mm quick link to pass through. Fit the dihedral brace to the wing and leave to dry. R-1 can be glued in now.

The top sheet can now be added. Use Aliphatic resin for this job. I clamp it to the main spar with clothes pegs and then pin it to the leading edge with map pins. Also glue on the rear spar top cap-strip. Once the glue has dried the wing can be lifted from the board. By doing it this way there is no possibility of warps creeping in.

Fit the paper tubes for the servo leads. The easy way is to wrap them round a length of dowel, feed them through and allow them to expand. Then apply glue and leave to dry.

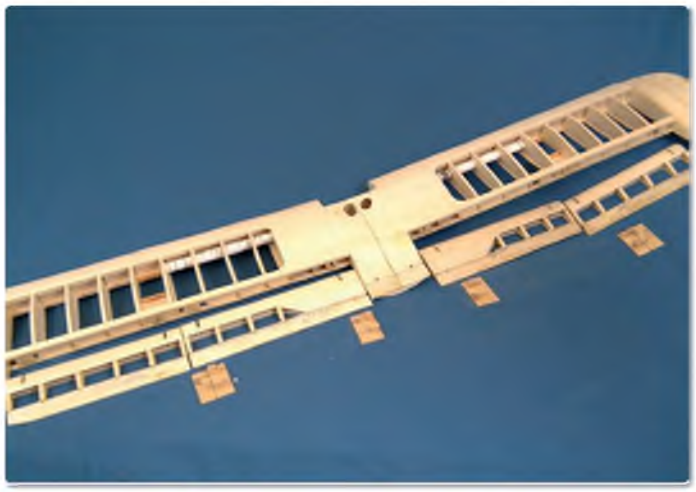
I normally join my wings before adding the top sheet to the second wing but that is not necessary for this model.

The second wing is built in the same way. Once it reaches the same stage as the first wing they can be joined. Then fill in the main spar with the 1/4" ply filler. This takes the front wing dowel, which goes right through into the two R-1s.

The 1/4" square spruce pieces are glued to the ribs; these take the screws for the servo mounts. The lower centre section sheet can be fitted and the trailing edge added. Also fill in the rear section with balsa to prevent the wing bolts crushing the trailing edge. Finally, add the top centre section sheet. Fit a 1/16" ply plate under the wing to take the wing bolt heads. This can be extended to forward of the rear spar. The cap-strips can be fitted to the ribs.

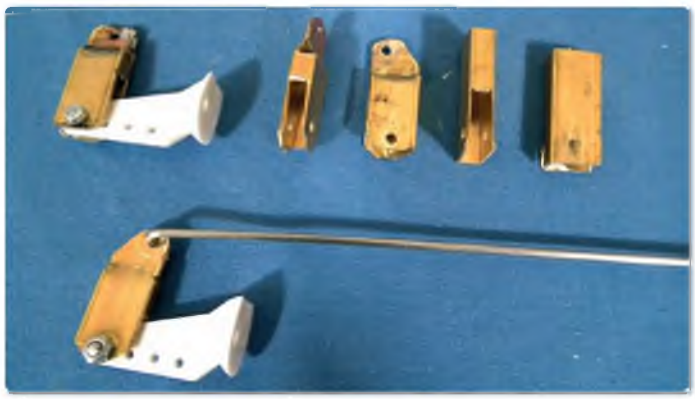
The shroud for the control surfaces is made from 1/4" x 3/4" trailing edge section. This should have the rear shaped to a sharp

Top view of the tip



Complete wing ready for covering. The shrouds have not been glued into place yet

View of underside showing fairing and stringers



Hinge components. The flap hinge has a pushrod near the forward edge; the aileron has a central pushrod connection

Complete aileron unit. The pushrod will need a bit of bending for free working

Cockpit detail

edge. Most commercial trailing edge has quite a thick rear end.

Flaps And Ailerons

These are hinged well back from the leading edge. I also wanted the control horns to be invisible as per the full size. I have to admit that this makes life a little complicated but it looks so good and works so well that it is worth doing.

Start off by pinning down the lower leading edge sheet and gluing down the lower spar. Also glue on the 1/8" square leading edge. Then add the ribs. You will need to support them with scrap 1/16" sheet behind the spar. Glue on the top spar and add the trailing edge. This is a non-standard size so you will have to shape it from 3/8" sheet.

Now glue in the R-h ribs. These need to be very accurately placed. I used 3/16" x 3/8" K&S rectangular brass tube as a spacer. This is used to make the hinges and horns and will be epoxied into the space between the R-h ribs.

Once the glue has dried you can glue the pieces of 3/16" x 1/8" spruce into the rear of the gaps between R-hs; this must seat up against the spars.

Now glue the leading edge sheet to the leading edge and leave to dry. Next wet the leading edge sheet and bend it over the nose of the ribs and glue in place. Leave to dry.

The control surfaces can now be lifted from the board and the cap-strips added. Carefully cut the sheet away from the hinge slots. These will need to be widened at the top where the 'Z' bends go and relieved at the bottom to allow the centre of the hinge bolts to line up with the bottom of the control surface.

The Hinges

You need eight hinges, four with control horns and four without. These are made from Radio Active long control horns, 3/16" x 3/8" K&S rectangular brass tube, 2 mm machine screws and stiff nuts, and normal 2 mm threaded rods with 2 mm quick-links.

The brass box section is cut to the dimensions shown on the plan. Make the ones for the horns a little longer as these are cut and the tops pressed together. Cut the slots up the front face of the part to allow for the horn.

Cutting the brass is easy to do with a fine Dremel cut-off disc running at high speed. (Warning: Always use safety goggles when cutting with a cut-off disc.)

Squeeze the tops together on the hinges that incorporate the horns and solder together.

Drill the 2 mm holes for the screws and the 2 mm rods. The rod length will have to be adjusted to suit the final location of your servos. The quick-link allows for fine adjustment.

Ready to fly showing the scalloping and outlines

The dummy Rotec radial engine. See January issue for details of how to make one

A charming little scale aeroplane for lazy Sunday flying

The control surfaces need to have slight trimming to allow for the hinge bolts and the 'Z' bends on the pushrods.

Final fitting is done after covering when the hinges are screwed in place and final fit of everything is checked before epoxying the brass tubes into their cut outs. This should be done with great care and only one control surface at a time is fitted. Trust me on this!

Wingtips

These are built exactly as per the full size. Take two pieces of 1/16" x 4" sheet for each tip and wet them. Clamp them down to form the bow and leave to dry. Then take the, apply aliphatic resin and clamp them down again and leave to dry.

Cut them to the plan shape and add the 1/16" edges and the top rib. Glue the underside supports in place and add the underside rib. Then glue the complete unit to the end rib on the wing.

If you have downloaded the full-size assembly manual you will get a good set of illustrations of the assembly sequence.

Tail Assembly

I used soft 1/4" sheet for the tail parts. These are pretty simple to cut out. Apart from shaping them and gluing in the ends there is only one other job to do; the rigging wires do add some strength in the event of a tumbled landing or just knocking the model in transit.

Cut pieces of 1/4" dowel 1/4" long and insert these in the locations shown. Drill them out for 2 mm bolts. After covering get some 8 BA solder tags and bolt these on. Get some strong stranded wire. I used control-line wire but closed-loop wire is fine.

The ends are fed through small brass tube, through the solder tag and back through the tube, which can then be soldered or crimped. The connections under the fuselage are screwed to the tail wheel mount.

Covering

I used Solarfilm Supershrink Polyester. This is superb covering material and lighter than most of the others. It is also more tolerant of over enthusiastic application of heat and it shrinks beautifully.

I must confess that I got the radius of the scallops wrong, which then made cutting the pin striping almost impossible. Rather than have a real dog's dinner of the pin striping, I decided to leave it off. The radius should have been much less than mine.

Cutting the scallops is easy. Just use a Gyro-Cut tool, sold by Traplet. I suggest experimenting with a pair of compasses on a large sheet of paper. I will not give you my measurements as they were obviously wrong, with too small a radius.

Installation

The installation is pretty simple really. The engine is mounted on a long engine mount. This will need a little grinding away where the dummy engine fits but nothing that weakens it. The tank is slid in through the radio bay. It is a good idea to use cables or wire to pull it right through.

I also coat the neck of the tank with silicone bath sealant. This holds it in place and seals the firewall but allows for easy removal of the tank if necessary.

I used three Hitec HS322 servos in the fuselage. These just fit nicely. They are mounted on 1/4" x 1/2" spruce bearers.

The ailerons and flaps are operated by Turnigy 9 gram metal-geared servos that have adequate power. These are mounted as shown on 1/16" ply hatches, with spruce bearers glued and screwed to them. These are held to the bearers with small self-tappers.

I will admit that adjusting the quick-links for the controls is very fiddly, as one has to take the servo out of the wing, remove the clevis, adjust and reassemble for each adjustment. However, once done they do not need to be touched again.

Since the flaps move in the same direction, unlike the ailerons, they must be connected either with a 'Y' lead with a servo reverser in one arm of the 'Y' or by using two channels and mixing them. I used the reversing 'Y' lead as this is easier. I have used these on both Spektrum and Hitec radios.

The switch is fitted on the sloping part of the front cockpit floor. The battery drops in between F-2 and F-3. Wrap it well and fill the bottom of the bay to prevent it rubbing on the bolts that holds the undercarriage on.

The windscreens are just cut out and bent from clear plastic sheet. Instrument panels can be found on the assembly manual and printed off. They can then be reduced on a good photocopier. You could make them better by cutting out 1/32" ply panels and gluing these over the top of the paper ones. Since the instruments are hard to duplicate from other sets, this would be the best way to do it.

Control throws are set at:

Aileron:	High rates – 1" (25.4 mm), low rates – 3/4" (19 mm)
Elevator:	High rates – 1¼" (31 mm), low rates – 3/4" (19 mm)
Rudder:	High rates – 2" (50 mm), low rates – 1" (25.4 mm)
Flaps:	Full down 40 degrees, measured on under surface of wing

These are starting points and you may want to change them.

Balance the model at 2 5/8" back from the leading edge. ***RCMW***

The large flaps slow the model without height loss but the LoCamp remains steady

CONTACTS

WWW.AEROLABUSA.COM
Download the complete full size assembly manual and colour three-views of the aircraft, plus construction photos and instrument panel details

WWW.ROTECRADIALENGINES.COM
For details of the dummy engine

WWW.MODELFIXINGS.CO.UK
For screws, etc. Especially the 2 mm screws and stiff nuts specified for the hinges

Flaps up for landing and the LoCamp just floats in nicely

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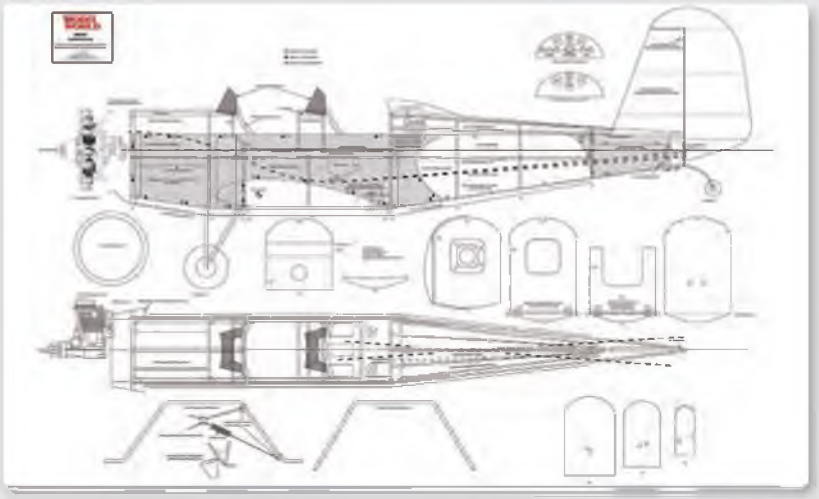

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And Now, Starring... You!

Chris Williams has long enjoyed rigging up action cameras to take in-flight pictures and videos of his scale gliders. In this article Chris shares some top tips and recommends his latest action cam – the Mobius

The view from Mount 1. Author's Flamingo at the WSA 'Horses' site

The view from Mount 2. Note the lack of distortion in the Fournier RF5's wings in the centre of the picture

Modern life may have many downsides but when it comes to re-living moments that heretofore relied on a dodgy memory there is never a better time to be alive. I don't know about anyone else but a week after a flying session most of the details have faded and all that's left is a general impression of a day that might have been good, or bad, but only the highlights (or lowlights) remain. It never ceases to surprise me how few people record their activities, even with a few shots from a still camera. But now the technology exists to do so much more than that.

For some years now I have had considerable success with the GoPro miniature action camera, making many a memorable movie of the various models in my fleet. But now it's time to take a look at the Mobius. The big advantage of this new-ish kid on the block is that it is a darn sight smaller and lighter than the GoPro, but with a similar high quality result. This means two things: you can now capture video on smaller models, or you can now set the camera up from a further distance from the model for a whole new range of on-board views. But more of that later.

Another point worth mentioning is that being priced at around fifty quid, this camera is a fraction of the cost of its more glamorous competitor. First, lets take a look at this little widget.

In-flight refuelling? Maybe not for a glider! The view from Mount 3

The view from Mount 4. Author's third scale Kaiser K11 at the Wimborne MAC

Measuring 60 x 33 x 18 mm and weighing in at a meagre 40 grams this camera begs to be taken aloft. And its three programming buttons don't need the services of a rocket scientist to work out, either. One button switches the unit on, one button scrolls through the three available modes, and the third button sets or stops the recording. The three modes are: normal video, upside down video (useful for mounting under the wing) and still photography. The stills are of excellent quality (as is the HD video), measuring 2304 x 1536 pixels, and the interval between shots can be set by the user.

It's not my intention to describe the camera in detail. There are plenty of web reviews for that, but rather to concentrate on using the camera to record a model in flight.

What Do You Want To See?

So, the first thing to decide is what you actually want to see. If you just want to see your local patch from the air this will take all of one flight and the novelty will pretty soon wear off. Whether you have lovingly built your model, or bought it ready-made, it has always seemed to me that the most desirable thing is to see as much of the airframe as possible in the video and to do this you will need to use a wide angle lens, preferably as wide as possible.

The Mobius is available with three lens types, I believe the 'C' lens being the widest. The downside of this is that there will be a distortion in the final result, often resulting in a weird bend in the wings around the outside of the picture, a result some people find hard to live with.

Consider, however, the opposite effect: with a lens of a longer focal length there will be less distortion but only a smaller area of the model will be in view. And it will also blot out the scenery above which it is flying, which rather negates the whole enterprise.

Another factor to take into consideration is that of vibration. On the whole the vibration from an electric motor is not an issue but the shaking from a two-stroke Satanic Vibrator certainly will be, resulting in a video with your airframe distorting and bending in an eye-watering fashion. This is often referred to as 'Jello' and there are a variety of anti-jello mounts available out there. But once again, as mainly a glider person, this is out of my purview.

Talking of mounts, there is one mount available for the Mobius that is essential.

Mount 4 on the 1/4 scale K11

Mount 1 on Geoff Crew's HW-4 Flamingo

Mount 2 on the rear of the author's 1/4 scale Slingsby Eagle

It has a double-sided base and a ball-and-socket arrangement that makes the necessary task of setting up optimum camera angles a doddle. Using the very strong double-sided tape on your precious airframe may be OK if you're talking about a glass jobbie but is probably a no-no on a painted wooden airframe. So let's see about the best way of attaching the camera to the airframe.

Setting Up

The first and most obvious way is to attach the camera to the wing, pointing at the fuselage. If it is a high-winged model then the camera can go on the wing's under surface, set to the upside down mode.

Since it is so small and light you can actually sit it under a couple of rubber bands. I have done the same thing on one extremity of the tailplane with excellent results. You can also set it on top of the fuselage behind the cockpit, facing forwards or back, but without getting more adventurous that's about it.

If you want results that are more interesting then you are going to have to venture into the territory of making up some extension mounts of your own. The object of the exercise is to set the camera as far away from the airframe as possible and at the same time at an angle that allows you see it at its most flattering.

I have found four views that give extra satisfaction and the advent of the Mobius means that these views can be a little more extreme. Obviously, this means mounting it on a stick and poking that stick out at all angles to get the job done. The snag is this: the longer the stick, the more the wobble, so a way will have to found to stabilise the video, although wobble is less of a problem with stills.

View 1

This is the simplest view to set up and consists of placing the camera in front of the wing, looking across at the model. First requirement is a tube of some description, aluminium or carbon, it doesn't really matter which. Then, you need something that will attach the tube firmly to the wing.

So far with the Mobius I have used balsa to do the job, with a Velcro strap to hold it to the wing. The balsa is shaped roughly to the wing profile, which is OK when tailored to a specific model but I have found it to be problematic when applied to other models with a different chord thickness.

A temporary solution has been found by splitting the balsa at the front and taping up with insulating tape, the stretching qualities of which allow it to be used as a sort of hinge. So, now, with the adjustable mount attached firmly to the tube, the camera is reasonably rigid in the up-and-down regime but alarmingly wobbly side-to-side.

The next solution is to make up a wire strop from rudder cable wire, which loops around the camera mount and is attached to the wing with a strip of the ever-useful insulating tape. If you want to avoid the use of the strop you will have to make the tube shorter at the cost of a less dramatic camera angle. The tube in the photo, to get into specifics, protrudes 450 mm from the wing LE, which is a fair old distance.

View 2

This is the view from behind... The camera mount, made up from strips of spruce or ply, sits vertically above the fin at a height of 260 mm. Once again insulating tape holds it in place. You might notice that each of my mounts has its own ball-and-socket attachment; this is because they are so inexpensive that it saves a lot of messing about to have one on each mount.

You may wonder about messing with the

Mount 3 on the front of the Flamingo

The current collection of camera extension mounts

The smallest model yet to be filmed, the author's fifth scale Duster

Coin of the realm showing the miniature Mobius and one of its ball mounts

C of G in this fashion. I have found with all my models down to 1/4 scale that it has not been necessary to add ballast to the front, and this applies to the much heavier GoPro too! You always have to be ready to apply some down trim but this speaks volumes for the capabilities of the HQ wing sections that I utilise in my designs.

View 3

The view from the front... If you think that the camera mounts I have made so far look a trifle Heath-Robinson, wait until you see this one! The view from the front is often the most dramatic, especially if you have an animated pilot, and it's probably the most difficult to achieve. You will probably have seen the view from an aerial tanker as a jet fighter attempts to hook up to the fuel probe; well we are looking for something similar and even closer.

This mount consists of a block of balsa with the tube poking out some 340 mm and angled back slightly to get the camera a little further away from the model. Lolly sticks (you can probably buy them from your local Pound Shop) are taped to the balsa block and stick out at the back. The whole thing is shoved on to the nose of the glider and yet more insulating tape is used to hold it in place. (You might want to stock up on insulating tape!)

As an added wrinkle you can insert a short dowel into the balsa block that will, with luck, locate into the tow release aperture for added support.

View 4

This one is pretty radical, even for me... It's a take on View 1 but with the added dimension that, as well as being in front of the wing, it is also well above it. The mount construction is similar but in this instance the tube goes upwards at around 45 degrees. This creates a serious wobble problem, which is how the strop solution came about in the first place. The view from this angle is a bit special, looking like the view from another aircraft flying in suicidally close formation.

Aim Carefully

I mentioned earlier about the spherical distortion inherent in a wide-angle lens. The one thing I have noticed about the Mobius is that the distortion is pretty much absent across the main part of the lens, being limited to the outer perimeter. This means that if you are careful with aiming the camera most of the distortion can be eliminated.

I have found that, in general, if you aim the camera at the rear of the canopy from any of these four positions the results will be the most pleasing that you can achieve. From both the front and the rear positions the wings should be at or near the centre of the picture where they will appear as they are, mostly straight! As the camera has no means of previewing the result at the field you could save yourself a lot of heartache by testing it out at home and checking out the optimum angles by looking at the pics on your PC/Mac.

I am more than impressed with the little Mobius. It gives enormous value-for-money with top class results and is perfect for fitting to R/C models. The smallest I have fitted it to is my fifth scale Duster, which wobbled a little on launch, but proceeded to glide afterwards without too much trouble.

Of course this is only half the story: once you get home with your precious footage, what's best to do with it? Well, that's another whole story, maybe for another time.

Meanwhile, what you've seen so far is just a whole bunch of words. If you want to see all of the forgoing in action, just Google: ONE HILL 2 FLAMINGOS. **RCMW**

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Extra 330SC

Matthew Poots goes freestyle with the latest 6S size Extra from Hangar 9

One of the latest scale aerobatic designs from Hangar 9 is based on 30 years of aerobatic evolution from the Extra Aircraft Company. The legendary Walter Extra's first single wing design was the Extra 230. Many improvements and tweaks later we now have the single seat Extra 330SC. Not only is the Extra a proven design in the full scale world, it is one of the most successful R/C designs ever, winning every Tucson Shootout since 2004, the IMAC World Champs and XFC to mention a few.

When I heard Seth Arnold, three times XFC Champion, had developed this product from Hangar 9 I was very excited. Seth is one of the very best Freestyle pilots in the world right now and with the new modern freestyle routines being extreme in every sense recent aircraft designs have changed in the last few years. Control surface area has got larger, airframe weight has decreased but strength has increased, so all of the really aggressive 3D manoeuvres are possible, flight after flight. With Seth's input this 60e class aircraft is going to compete with other 'heavy hitters' in this class, such as those from Extreme Flight and 3D Hobby Shop.

The Build

As we have come to expect from Hangar 9 products the quality of the finish of all components is of the highest standard. From opening the colourful box, every item is carefully packed for the upmost protection during transit. Upon un-bagging each item you can appreciate the time and experience put into a modern ARTF. The UltraCote covering is perfectly applied, the paint match on the cowl is 100%, the carbon wing tube is high quality carbon and the scale shaped carbon U/C is beautifully finished in a high gloss carbon weave.

After the initial check over of all the parts the first thing I do is read the instructions and Hangar 9 instructions are probably some of the best on the market. A picture and description accompanies every task, along with a simple symbol system that guides you if the item is handed, for example, or if you have a number of the same items to apply, i.e. hinges. It gives you full confidence at every step.

First on the agenda are the wings. Not a lot to do here really. Starting with hinging the ailerons, five 'hairy' cyano hinges are installed per aileron. The aileron horn is installed using 5 minute epoxy, the surface of the aileron is protected with low tack tape and the horn itself is 'scuffed' to ensure maximum bond between the horn and wooden block within each aileron.

The mini 5060 aileron servo is now fitted in the pre-cut slot. The instructions give clear guidance on this; they also give you precise measurement for the control linkage length, in the case of the ailerons 97 mm long (hole to hole).

The instructions state that you need to enlarge the hole in servo arm to a 5/32" (2 mm) hole but this is an error on Hangar 9's part. This should read 5/64". I have spoken to Mike McConville, Design Director for Hangar

The Extra is destined to be Matthew's IMAC sequence familiarisation model

Safely removed from their protective bags the neatly finished airframe parts await assembly

9 and they hope to correct this in future manuals. The hole is enlarged to accept an M2 machine screw, which secures the ball link on the control linkage. The screw is retained with a nut/washer and some Loctite, after which the linkage becomes very strong and slop free.

To finish the wing assembly you are prompted to trial fit the wings to the fuselage. There were no issues with this part of the build; everything aligned and fitted perfectly.

Onto the fuselage next. The first task on the fuselage is to simply cut a slot in the covering for some cooling. This just needs trimming neatly with a scalpel and sealing with a covering iron. The A6220 elevator and rudder servos can be installed in the pre-cut slots. The elevator is at the rear of the fuselage and requires an 18" extension cable; the rudder servo is mounted just behind the wing tube and utilises a closed loop. The rudder servo tray also doubles up as the receiver mounting tray.

At this point I mounted the AR636 receiver with super strong 3M double-sided tape. If it wasn't an AS3X gyro Rx (which isn't necessary on this aeroplane) I'd have just used some Velcro with a strap for safety.

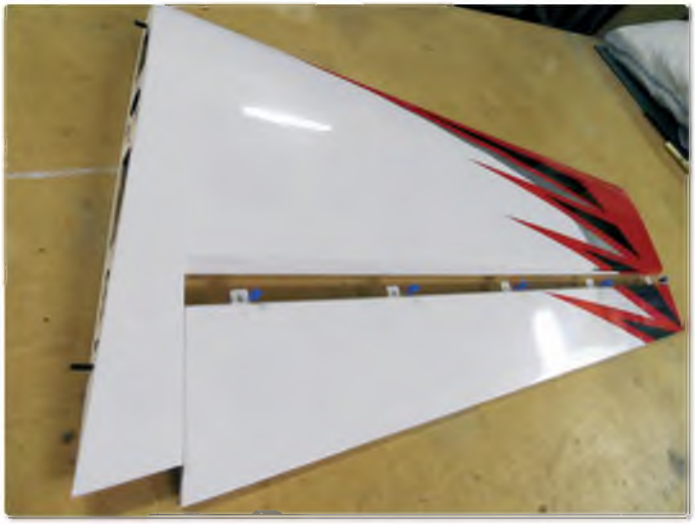
The one piece stab can now be fitted. The fuselage has a pre-made slot ready for the stab and to ensure alignment during the build Hangar 9 have built the fuselage with the fin post/trailing edge fully installed. This needs to be removed with a razor saw, then the stab can be pushed into place, checking for level and alignment.

Once satisfied everything is correctly placed the outline of fuselage can be marked with a non permanent marker on the stab top and bottom. The UltraCote is removed over the glued contact area, trimming it approximately 1/8" inside the marker line. 15 minute epoxy is then used to glue the stab into position, again checking alignment and level one last time. The section of fin post which was removed is in-filled with a block supplied in the kit, fitted with 15 min. epoxy.

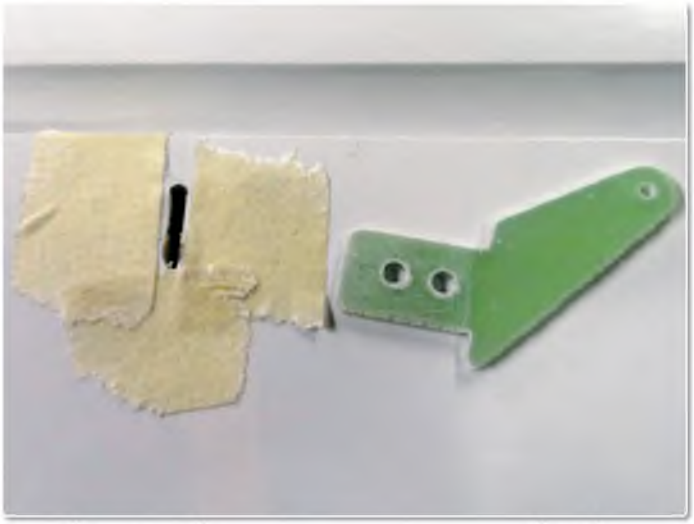
The elevator horn, linkage and hinges are all fitted using exactly the same method as the ailerons, and as before it makes for a slop and resistance free linkage. The steerable tail-wheel is fitted onto the rudder before it is hinged. The tail-wheel is a good quality item and fits really easily and well. At this stage the rudder horn is fitted in the usual way. The rudder is now hinged to the fuselage using three cyano hinges. Once they have cured the tail wheel bottom mount is fixed to the fuselage with two M3 screws. With the rudder fitted the closed loop can now be installed. All the accessories are supplied to complete this. Hangar 9 have supplied a threaded sleeve fitting that attaches to a ball link and the closed loop sleeves slide through. This makes for an easily adjustable linkage that gives positive and accurate movement.

The undercarriage and spats are now assembled and fitted. You can now get a sense of the size of the model as it sits on its feet.

As I elected to use the E-flite motor, this fitted with minimal work, requiring just the standard E-flite X mount holes to be opened out slightly, as described in the instructions. This is to allow the motor to be fixed with M4 bolts to match the pre-installed captive nuts in the motor-box. The Castle Talon 90 ESC



First job is to hinge the ailerons



Small pieces of masking tape protect the UltraCote covering prior to gluing in the aileron control horns

Using a pin as a depth marker stops the hinge from being inserted too far

Making up the aileron pushrods to the recommended length

Aileron linkage complete – after opening up the holes in the servo arms to 5/64"

is mounted underneath the motor box and is attached with Velcro and a strap for safety.

With the motor now attached the cowl can be fitted. With the spinner fixed in place ensure there is approximately a 3/32" gap between the back-plate and cowl. There are hard points pre-installed in the fuselage ready for the cowl to be fixed to so this is a really straight forward part of the build. A simple paper template is used to ensure the holes in the cowl are drilled correctly.

I chose to use an Optipower 6S 4300 mAh Ultra 50C pack on this model. Having used Optipowers in a number of my aircraft I knew these packs would give me maximum power and longevity. It's also re-assuring to know that you have a friendly customer service base right here in the UK; Andy and his team are second to none if you need any advice on set-up and it's good to support UK companies in our hobby industry. The battery bay on the extra is quite big, so it would be possible to run up to a 5000 mAh pack. But the lighter 4300 mAh will give the ultimate power to weight ratio.

There is the option to fit some side force generators. These will increase the rudder authority; they fit to the wingtips using pre-installed captive nuts.

AR636 Setup

I elected to use the Spektrum AR636. This receiver uses the latest AS3X technology from Spektrum. On a model of this size AS3X is not required to make the plane fly well, but what it does is open up the conditions in which the aircraft can fly. On a windy day for example you will be able to fly this aircraft very comfortably with the help of AS3X, without having to fight the wind all the time. On a day that you might not otherwise go flying, you can take an AS3X equipped model out and fly it time after time.

One other major benefit to AS3X is set-up; the set-up process of an aerobatic aeroplane required to get perfection takes a lot of flights. Years of experience go into the techniques required and it can be a time consuming process. I've been competing for over a decade and I'm still learning.

Club flyers probably won't get the stick time on a new model to work at the set-up to what a competitor like myself might call 'correct'. But if they could get that 'correct' set-up then they can enjoy every model to its full potential, almost from the first flight. The competitors amongst us will always

Close up on the elevator linkage using the longest throw available on the servo arm

The rudder post needs to be cut away with a razor saw prior to fitting the tailplane

Rudder operation is via a closed loop system

Detail view of the tail-wheel assembly

tweak set-ups and look for improvements, even if it means hours and hours of flying for small gains. But most people just want to fly, so they fly around a poor set-up. But AS3X means they don't have to – they will enjoy the plane and start flying it better because they are more comfortable.

AS3X, in simple terms, opens any model up to any pilot, once they see how great a model can fly. I bet they will start to consider a true set-up, which they may not have done before.

The AR636 is programmed via a mobile device, in my case the iOS app available for free through the Spektrum RC website. A programming cable is required, which uses the headphone jack on the iPhone. All the basic settings, like travel, expo, reverse, failsafe are set via the app. You can leave it at that, and you don't need to setup any AS3X settings, but it's so easy why not try it?

You can have up to three flight modes. I decided to use flight mode 1 for 3D, flight mode 2 for aerobatics and flight mode 3 for aerobatics with AS3X disabled so I can compare things.

In flight mode 1 (3D) I set the Rate Gain to high percentage values. The aircraft will be flying on the stall for most of these manoeuvres so I want the receiver to react quickly to the aircraft's attitude. You will also see that the dual rate and expo figures are high, which is typical for 3D. I will look to reduce the expo figures as I tweak the set-up as typically with AS3X you need less expo. As you can see in flight mode 1 there is some serious throw – 80 degrees on the elevator! (See overleaf.)

In flight mode 2 (aerobatic) I set the Rate Gain to low percentage values. The aircraft will be flying at mid to high speed for most of these manoeuvres so it won't need as much reaction from the receiver. If I set the gain too high in mid to high speed manoeuvres I will get some oscillation in flight, telling me I'm too high. Again, notice the dual rate and expo percentages are lower.

Flight mode 3 was set to be a general set-up, without any AS3X input. If I got my percentages wrong or set the receiver orientation incorrectly (i.e. the gyros would work in reverse), I can flick to that mode on the test flight and fly without AS3X and land safely. It's purely a 'user got it wrong' failsafe and it's always a good idea having this mode available until you have flight modes 1 and 2 set-up to your liking.

The Flying

The test flight took place on a wet, blustery day – perfect conditions for a test flight! With all pre-flight checks complete the rain stopped for a short time and that allowed us to fly.

The E-flite Power 60 was fired up and quickly the Extra was in the air. It felt very stable and comfortable from the off, with a small amount of up trim needed. I advanced the throttle and pulled into a gentle Half Cuban 8. The power from the E-flite Power 60 is phenomenal; it pulled through the loop with ease and from my experience of giant scale IMAC aircraft it reminded me of my large Hangar 9 Extra, powered by the Desert Aircraft 120 cc.

On the half roll to level in a Half Cuban 8 the aileron rates felt about right. I had a very slight bounce back on the aileron stop; that let me know that my AS3X rate gain on the ailerons was a little too high. Not by a lot, just 3-4%, so a minor tweak on the set-up will have it perfect.

On the exit of the 45 degree down-line the feel of the elevator was perfect, exactly how I set up my IMAC planes. I then flew some basic IMAC manoeuvres with both positive and negative snap combinations. The Extra handled these with ease and felt very predictable on the exit of the snaps. I tried knife-edge and was very pleased with the performance and rudder feel; I flew a number of passes at different angles of attack and quickly felt at home with this aircraft.

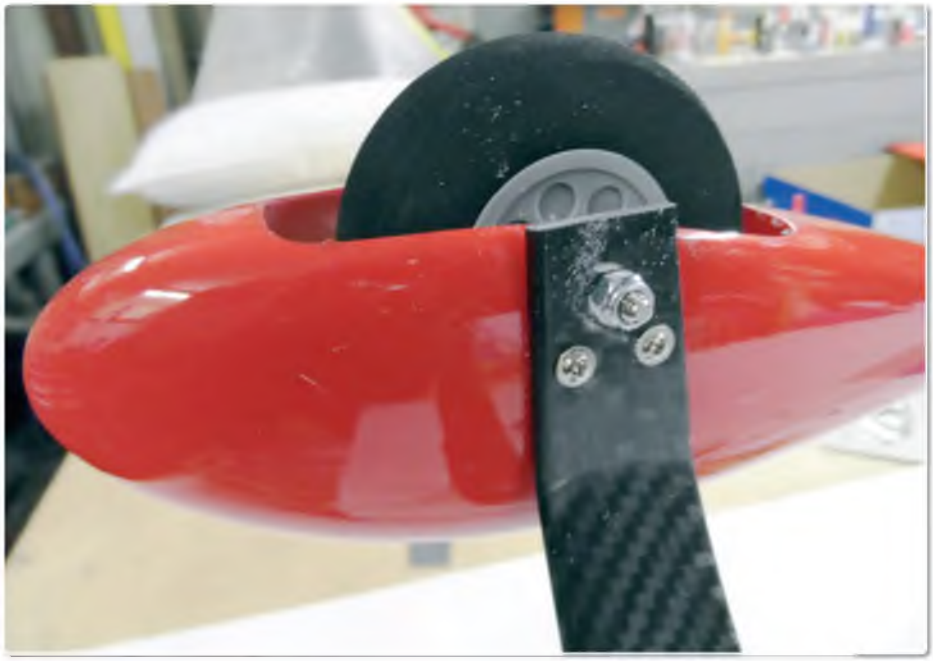
With confidence building, I decided to flick to 3D mode and got the Extra down low and pushed it a little. The model feels

The finished elevator and rudder linkages ensure large and positive control movements. Perfect for 3D and Freestyle

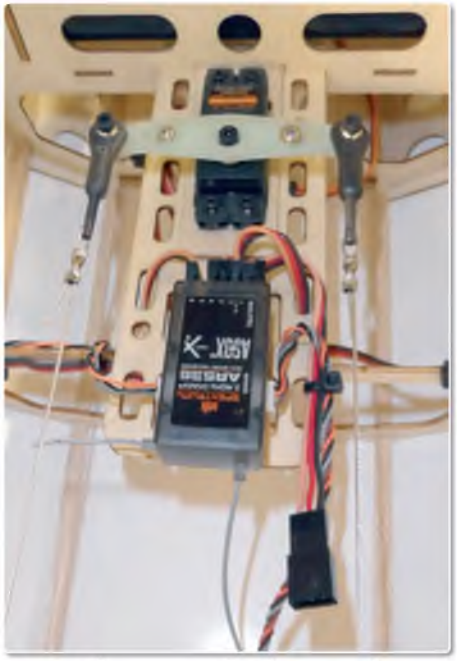
E-flite's Power 60 motor gives the Extra some serious power

Matt's Optipower 6S 4300 Ultra LiPo packs have balanced perfectly after some pretty heavy workouts

Carbon undercarriage and parts just prior to assembly



Close up on the spat attachments



Spektrum's AR636 receiver is set up using a smartphone app

really locked into any attitude post stall. The elevator has so much authority, yet a natural softness that gives great feel through the stick. With the huge throw available you can perform some crazy tumbles, pop-tops and really aggressive deep blenders. The ailerons offers a lot of roll rate and if you let your rolling harriers flatten out a little you get a fast roll rate, which looks really impressive.

The Extra's neutral feel means the rudder/elevator input is very manageable in the faster stuff. Going from level rolling harriers to circuits, or even a loop, almost feels easy – that's the confidence this model gives you. I was even able to fly a rolling harrier vertical 8; bags of power is available and this really helps with these power hungry manoeuvres – I just need to work on my radius... I'm a little rusty on my 3D!

My 5 minute timer went on my DX18 and it was time to land.

Extra Happy

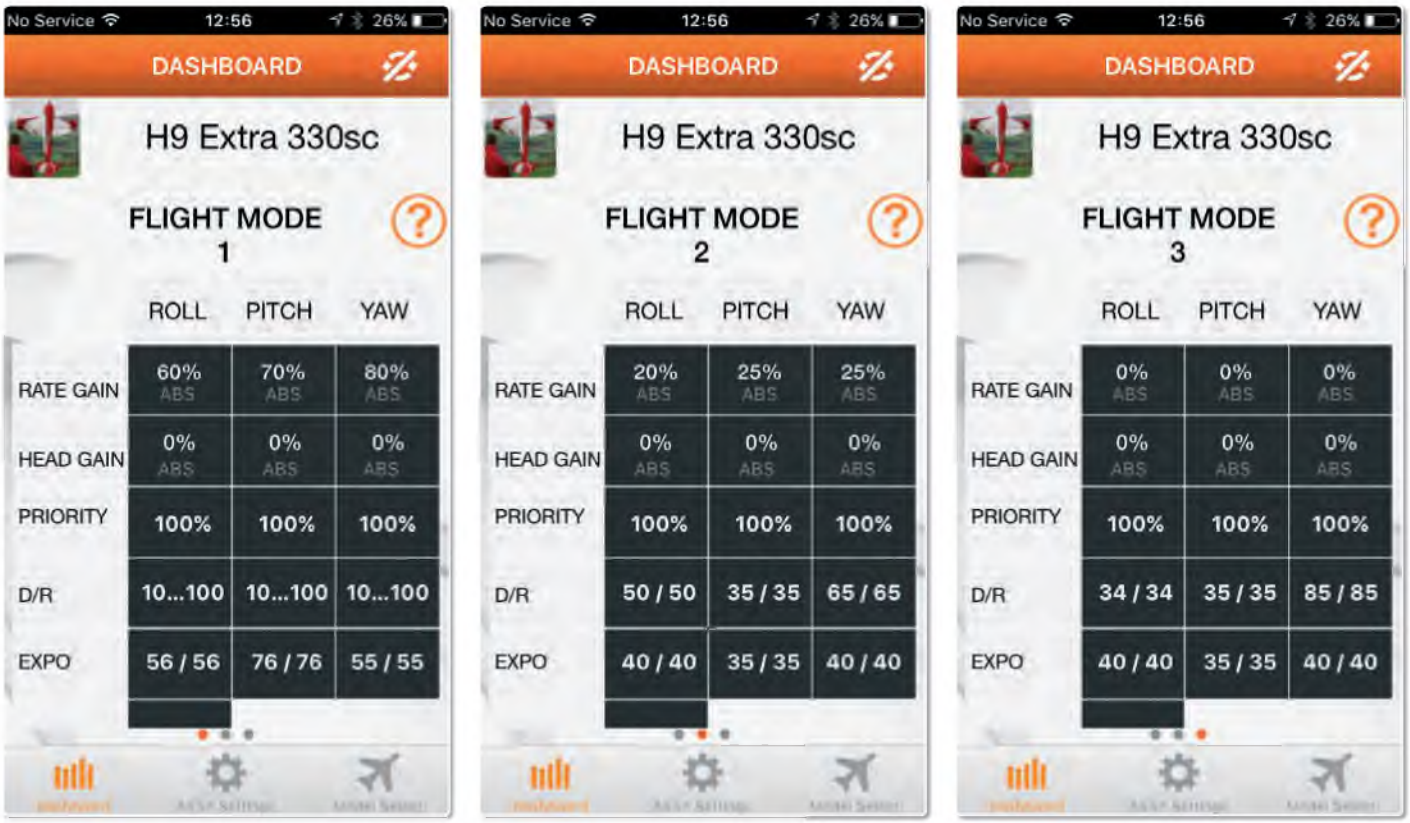
I have had several flights since on the Extra, fine-tuning the set-up and trying the Side Force Generators. The SFG's make knife-edge a tad flatter, with less rudder input, but honestly their effect is minor. As an IMAC purist I'll probably leave them off most times.

Hangar 9 have developed a really great product. I will have a practical use for the Extra as it will be my IMAC sequence familiarisation model. I'll be flying the new 2016 routine with the little Extra first, before I bring the bigger models out. It offers a really good balance between IMAC and 3D, performing both very well. The Power 60 motor, combined with the Optipower 6S 4300 Ultra's, has some serious power and with every flight my Opti's keep giving more, yet each time they balance perfectly.

Thanks again to Horizon Hobby UK for allowing me to review another exciting product and to Optipower for their flawless LiPo packs.

RCMW

Continued overleaf



It's always interesting to get a glimpse of a top pilot's set up figures, shown here direct from the AR636 app. Note the generous Expo settings

This is the sort of control movement required for extreme flying

The SFG's make knife-edge a tad flatter, with less rudder input, but their effect is minor

Ready for the trimming flights

The Extra felt stable and comfortable from the off, with just a small amount of up trim needed

In knife-edge Matt was pleased with the performance and rudder feel after flying a number of passes at different angles of attack

Bags of power is available and this really helps with power hungry manoeuvres

RC MODEL WORLD

MODEL INFORMATION

NAME:	Extra 330SC 60e ARF
MANUFACTURER:	Hangar 9
DISTRIBUTOR:	Horizon Hobby UK
WEBSITE:	www.horizonhobby.co.uk/aeroonline/e1hangar9/han9025/extra-330sc.html
PRICE:	£308.99

MODEL SPECIFICATIONS

WINGSPAN:	65.5 in (166 cm)
LENGTH:	63.7 in (162 cm)
WING AREA:	870 sq/in (56 sq/dm)
FLYING WEIGHT:	7.75 – 8.60 lb (3.5 – 3.9 kg)

ADDITIONAL PARTS REQUIRED

For the review I used the recommended equipment:

MOTOR:	E-flite Power 60 470 KV
SPEED CONTROL:	Castle Talon 90 A
PROP & SPINNER:	17 x 7E Xoar & JP Carbon
RADIO & RECEIVER:	Spektrum DX18 & AR636
SERVOS:	2 x Spektrum 5060 HV (ail) & 2 x Spektrum 6220 HV (elev/rud)

BATTERY: Optipower Ultra 6S 4300 mAh 50C

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The Art Of Wings

Get back into the habit of building balsa wings with this simple jig developed by Terry Westrop

The majority of model builders would regard the wing as the most important part of any model aircraft (often the most difficult to produce also). This is particularly so when dealing with precision aerobatic types, which are usually equipped with tapered panels. Over recent years, as kits or ready builds have provided finished wings, the art of wing building has all but become redundant.

During the 1980s I began constructing aerobatic models using my own balsa built up wings and tails. However, two decades of competition flying changed my approach, simply due to model development and time, and foam wings began to dominate. Now, once again, we see more built up structures. A built up wing is undoubtedly more time consuming but will invariably prove lighter. In contrast to foam wing manufacture almost any modeller has the ability to produce a balsa wing.

As many pilots will have found some commercial ARTF structures can be very difficult to repair due to the materials employed and the lightweight method of manufacture. It is often easier to replace the wing.

Balsa wing structures, such as that found on RCMW's Loaded Dice 30 EP (see heading picture), are far more easily repaired and extremely satisfying to produce. In addition choosing the grade of balsa employed in the structure offers the builder an opportunity to 'engineer' strength or lightness into the project dependent on the type of flying required.

With the increasing interest in EP lighter models are even more necessary to encourage a decent power to weight ratio.

Use a pillar drill to ensure that the guide holes are drilled vertically through the rib stack

The jig I used on my first aerobatic designs back in those distant 80s was a commercial product, from the USA. That jig has inspired this latest example. This type of jig can be situated almost anywhere - I use the kitchen table! The surface is not necessarily required to be flat as the end plates can be 'packed out' to compensate for any uneven area.

Jig Materials

Basically all that is required are the clamp plate assemblies plus two carbon (preferred) rods. However, dowel, alloy or even steel could be used, as indeed was the case on my original commercial jig. Ensure it is as straight as possible for obvious reasons. I acquired 6 mm carbon rods of 1 metre length from the Internet.

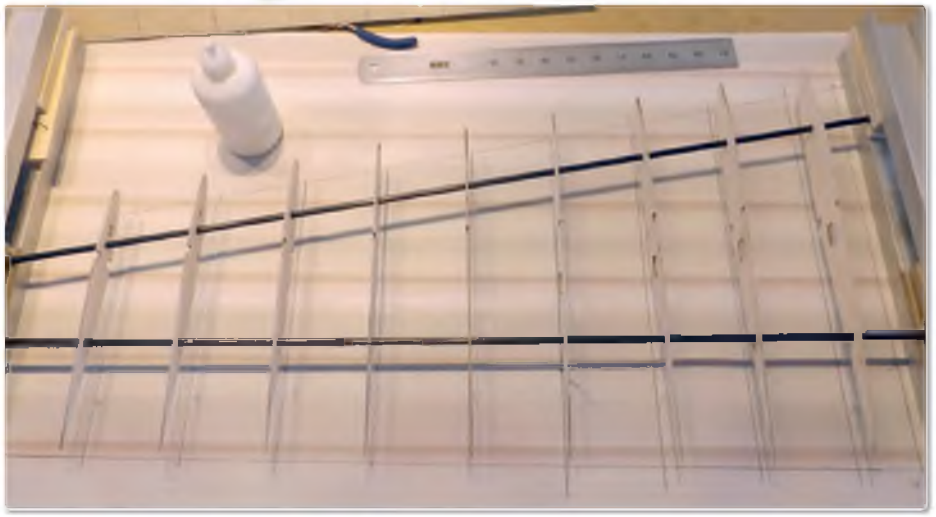
Naturally rod diameter and length will be determined by the aerofoil section and size of each panel intended. The end plate sizes will also be determined by the root chord of the panel. Use 6 or 8 mm bolts, washers and wing nuts or similar.

Jig Construction

My example utilised 15" end plates. This afforded me the capability to produce a root chord of 14". They can be as large as needed. Inexpensive pine will suffice as it will provide some 'give' when the wing nuts are tightened on the rods. 6 or 8 mm bolts and wing nuts are easily acquired but can be any sensible size.

Balsa 'packers' provide clearance over the wing nuts, thus allowing the jig to be inverted to complete both sides of each panel.

Left: These 3D drawings by Mal Luff clearly show the component parts of the wing jig. No sizes are given as the end plates will vary depending on the chord of the wing you intend to build



Building a wing. Stage 1 - Align the ribs over the plan

Stage 2 – Add the spars and Leading Edge, followed by the TE sheeting

Jig Use

Constant chord panels are the less involved task, simply cutting around a template until you have the required number of ribs. However, for tapered wings, ribs can either be made using the age-old 'sandwich' method or even better, your friendly laser cutter.

If using the former method, once you have all required ribs to hand ready for assembly, drill the holes for your carbon rods in a 'stack'. The general guide is to have 0.1 mm oversize holes to allow the ribs to slide onto the rods. More may be necessary on tapered panels. A delta form, for instance, may require 0.2 mm oversize to allow for the high angle produced, root to tip.

Draw a centre-line through each rib and align all ribs at the LE with TE on the centre-lines of each and pin together, one panel at a time.

Drill holes for the carbon rods, say 1 ½" in from the LE. A pillar drill is advantageous to maintain a vertical track through the rib pack. Next, align all on the TE, keeping the LE of each rib on the centre-lines. As the ribs will be thinner at the TE area drill these holes at a suitable distance in so as to allow the ribs sufficient strength. Mark and cut the spar slots if preferred at this stage, along with aileron servo lead holes.

Slide ribs for the first panel onto the rods into their approximate positions. Lay your plan or drawing down.

Hold the plan down using the end plates. Mark the rib positions on the spars, LE and TE balsa. Carefully slide the rib assembly into the end plates, line up all ribs to the drawing and clamp up the end plates using the 'wing nuts'. Use a firm feel, not 'spanner' tight. This will allow the complete jig assembly to be turned over to finish the other side of the panel.

Checking Alignment

Using the rods as a datum, look through from the TE to ensure both rods are parallel. Pack up an end plate as necessary to achieve this. When the jig is inverted, to address the reverse side, remember to check again. Pin the LE balsa in place and when all ribs are correctly aligned in both planes add glue. Add spars and TE. If you have any slight rib misalignment, say at the TE, gently sand using medium grit (150) on a flat block of perhaps, 2" x 12". I use ½" sheet balsa.

The panel can be completed in the jig. I tend to add LE and TE sheeting whilst the panels are in the jig but leave the centre section until the panels are joined. This allows better access for fitting the dihedral brace and aileron lead installation.

Once you have completed your first wing using the jig your next project will be met with even greater enthusiasm!

RCMW

Continued overleaf

Stage 3 – Add the top Trailing Edge sheeting

Stage 4 – LE sheeting clamped in place

Stage 5 – The wing panels can be joined after removing them from the jig

LOADED DICE 30 EP

Terry described the build of his Loaded Dice 30 EP aerobatic design in the December 2015 issue of RC Model World. It is the ideal aeroplane with which to build your first jig built model. A laser cut wood pack is available, which contains pre-cut wing ribs as well as other intricately shaped parts. Model specs and plan and part details are shown below:

LENGTH:	50.4" (1280 mm)
WEIGHT:	3 lb (1350 g), less LiPo
BATTERY:	3S 3300 mAh LiPo
RADIO FUNCTIONS:	Throttle, Ailerons, Elevator, Rudder
WINGSPAN:	47.25" (1200 mm)
MOTOR:	Aeolin C3542 1450 KV 850 W Brushless Outrunner
PLAN NUMBER:	MW3763
PLAN PRICE:	£15.50
***LASER WOOD PACK:**	£51.99
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Mayfly-6e

Introducing a 56" span polyhedral wing electric soarer, designed by Chris Ward for a 2835 in-runner brushless motor and three-function R/C

Free Plan

RC MODEL WORLD

At A Glance

MODEL TYPE:	Electric soarer
WINGSPAN:	56 in (1422 mm)
LENGTH:	36 in (915 mm)
A.U.W:	17 oz (480 g)
MOTOR USED:	Aerodrive B2835 2200KV brushless in-runner
ESC:	30 A
PROP:	7.5" x 4" Graupner Cam folding prop, 33 mm dia. spinner
BATTERY:	3S 800 – 1000 mAh LiPo
SERVOS:	Two 6 g mini servos
RECEIVER:	Small 4-channel

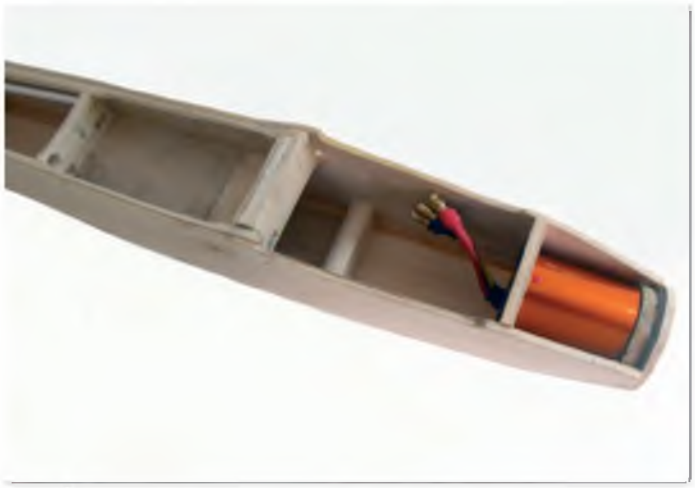
I have always been interested in soaring flight because of the challenge of flying in various weather conditions. I have therefore always designed and built my own models, believing that to achieve these results most commercial models are somewhat compromised in design to appeal and can be overpriced. In this type of model aerobatics are not really necessary, simplicity and clean design being adequate to achieve good thermal soaring results.

Mayfly-6e was designed to meet these ideals, being an upgrade of an earlier model, which I had built in the NiCad and brushed motor days. It is small enough at 56" span to fly in fairly restricted spaces and is best flown in 5-10 mph wind speeds. Mayfly can gain sufficient height to find thermals in around 30 seconds or less. Several climbs can be made on a fully charged battery, which will give plenty of lift searching time and flights of 30 minutes are easily achieved.

Its design principals follow previous models I have built, which have all given good performance for the objective of finding and holding thermals, and to stay airborne without power. Its wing section, SD7080, contributes to its soaring ability and is not a handicap on the powered climb due to using a battery and motor set-up that gives adequate thrust.

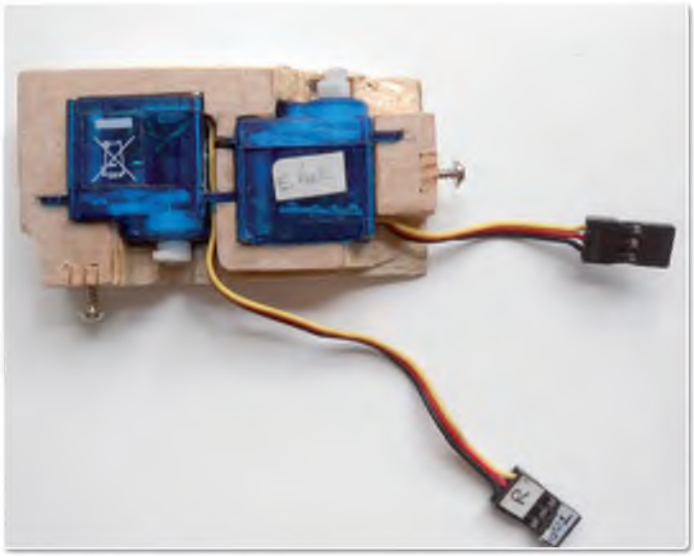
A slightly high set tailplane is used to work outside the wing downwash. I also believe in having a smooth spinner entry and a clean folding prop at the front to reduce drag in this area. I hate seeing a blade hanging down!

Construction has been kept reasonably simple and conventional, and follows traditional lines. It should therefore appeal to those who are comfortable in building balsa wood structures.

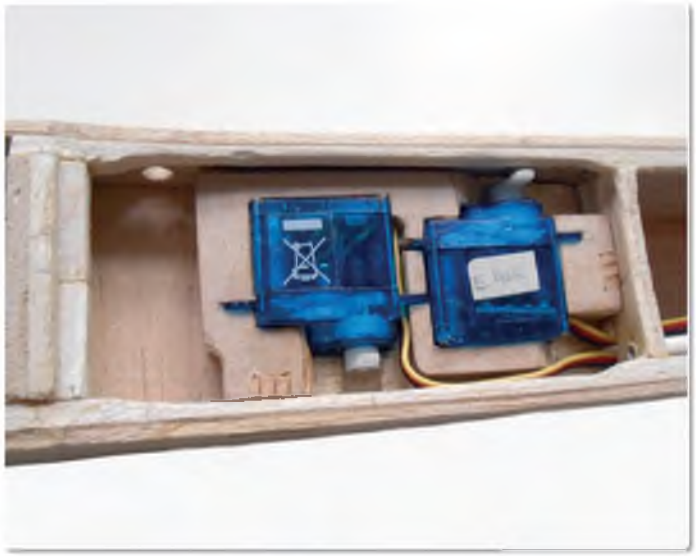


Basic fuselage with in-runner motor fitted for final shaping

Balsa cheeks added and sanded to shape



My method of mounting servos



Servo tray mounted inside the fuselage

Nose after final sanding. Note the servo tray position

Tail end. The anti-warp balsa inserts are gross-grain

A brushless in-runner was chosen, mainly to achieve a cleaner nose entry and overcome the difficulties of clearing motor wires, etc. when using an out-runner. The in-runner motor I used has a diameter of 28 mm with a KV of 2200. This swings a 7.5" x 4" folding prop mated to a 33 mm diameter spinner.

Power to the motor is provided by an 800 to 1000 mA 3-cell LiPo battery, and controlled by a 25 amp brushless speed controller. A four-channel receiver and two 6 g mini servos complete the simple installation.

As with all built-up balsa models careful selection of the wood is important to ensure parts are of adequate strength without the model going over weight. It is also a good idea to obtain the motor, battery, speed controller, servos and receiver intended to be used, so that trial fits and position can be checked during the build. Construction follows standard built up techniques so only the important build guidelines are given.

Fuselage

Start by cutting out the two fuselage sides and the 0.4 mm ply doublers at the forward end. Contact glue these, ensuring you make a left and right hand, and clamp down with weights to keep flat. Glue the 3/32" square edge strips to the sides, including the upper doublers at the wing root and hatch positions. Next make the double nose former from liteply and drill for the motor fixings. Check that the octagonal rear piece clears the motor outside diameter.

Next, cut out the three formers at the wing position and the liteply former at the forward hatch position. Prepare the double lower former ahead of the battery. This may be made by laminating four pieces of 3/32" sheet. Also have ready the control guide tubes to the rudder and elevator so that holes can be prepared in the relevant formers.

Join the two fuselage sides together at the wing positions and when set glue in the nose former, ensuring the four degrees of downthrust. Add the remaining formers. Set in the control guide tubes and ensure the elevator tube is angled to achieve its eventual alignment through the lower fin section, ensuring the curve is not too tight. Add the servo floor and when happy that all equipment will fit and line-up add the top and bottom sheets. Note the access cut outs in the top sheet at the wing seat position. Sand the nose area to accept the angled small pieces of sheet, which when glued and set allow the square fuselage to be blended to meet the round nose former.

Add remaining details and make up the hatch. This is retained by a tongue at its forward end and at its rear end by a rubber band at the forward wing dowel position. Sand and round off the fuselage corners as shown. Add the stub fin detail and the lower fin from three laminations. Note the slot in the inner lamination to take the control guide tube.

Tail

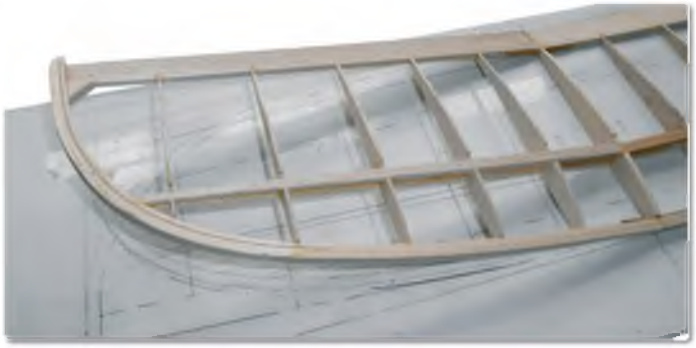
All items are from 3/32" sheet balsa. Note the anti-warp and stiffening inserts, where the grain is at 90 degrees to the main panel items. Hinging can be by your preferred method. I use nylon tape hinges as shown, which work well, the disadvantage being that the individual parts cannot be covered first. Make sure the tailplane is at 90 degrees and square to the wing seat, and that the incidence is set correctly. Fit control horns to suit and check the cut out in the fin and rudder to allow full movement.

Wings

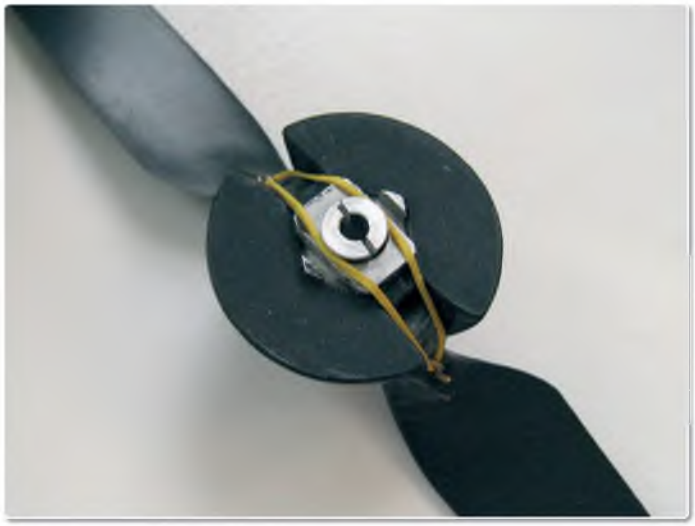
These again are straightforward built up structures. Choose light, flexible straight grained 1/16" sheet for the forward L/E covering and if possible quarter grain for the ribs. Stiff but not too heavy for the spars and leading edge. The trailing edge is not a standard section being 7/8" x 3/16". This may be cut and sanded from 3/16" sheet or stripped from 1¼" x 1/4" standard TE stock.

Points to note: The three inner ribs from 1/8" sheet are doubled with 1/16" sheet ribs

Homemade pushrod adjuster used at the servo end



Wing build showing tip laminations (see text)



Method of positively folding the prop

Mayfly ready to go

reduced by 1/16" in profile to allow the roots' two bays to be covered with sheeting.

Before starting the build obtain a suitable wing joiner and tubes around 1/4" or 7 mm in diameter, either steel or solid carbon. Also prepare the dihedral braces from 1/32" ply.

A 1/4" sheet former is required to match the tip leading edge inner profile. The tips are then produced by wrapping four laminations of 1/4" x 1/6" balsa strips, cemented well.

Carefully form the joiner tube holes in the three root ribs and epoxy in place during the build, not forgetting the pieces of web to support the tubes. Make sure the two inner panels are blocked at the correct dihedral angle and aligned during this process.

1/16" sheet webs are required between the top and bottom spars, ideally with the grain running vertically.

Sand the leading edges and tips to accept the leading edge sheeting and glue the top sheets first while each wing panel section is pinned to the building board. Finally, sheet the underside and sand the wings at the nose and tip to give the correct profiles. Complete the root end sheeting, not forgetting the 1/32" ply rubber band protector glued to the trailing edges' top surface at their root end.

Finishing And Installation

Wing and tail covering is a personal choice but needs to be lightweight. The original was covered in Solarspan 'Solite'. Choose colours that give good visibility at height. The tail surfaces were simply treated with grain filler, sanded and tissue covered. The fuselage, after final sanding, was also treated with grain filler then simply brush painted with two coats of matt black water-based blackboard paint and finally sealed with 'Ronseal' satin varnish. Finally, give a very light rub over with well worn fine grade wet and dry, and polish with metal polish.

The servos can simply be stuck to the servo floor with double-sided tape or by cutting holes for a tight push fit in soft 1/2" balsa sheet, which in turn is stuck to the servo floor. Make a groove for the servo wires to lead them to the holes in the former to the receiver bay. This is the method I have used as it allows for much easier removal of the servos for servicing if needed.

Choose your clevis connections to the servos carefully to ensure adequate clearance and no fouling to formers and the wing underside when these are attached.

If you are handy with a soldering iron suitable small servo pushrod adjusters can be made from 10BA or similar sized nuts and bolts, thin shim brass or copper and piano wire (see nearby picture).

Install the motor prop and spinner. It is helpful to have a positive and clean prop fold on motor shut down. As stated previously this reduces drag on the glide, especially on a smallish model. It may be helpful to re-drill the blade root pivot holes to get a neat, close fold. This can be also be helped by fixing, with epoxy, small wire hooks into drilled holes in the rear face of each prop blade root. A small rubber band can then be used between the blades to give a positive fold. Connect up the chosen speed controller and all connections to the receiver, and test everything for correct function.

Control Throws

Allow for at least +/- 30 degrees on the rudder, just in case of the need to correct for gusts on landing approach. Flying at altitude can be on at least 30% rates.

The elevator only needs +/- 15 degrees. If any more is needed then the model is out of trim!

Flying

Choose the right day with an approximate 5 mph wind. With everything set up, controls checked and range checks made, an initial hand glide will tell if the balance is about right. First power flight should be made on about 3/4 throttle, ensuring the initial climb is not overly steep. After gaining sufficient height the usual dive test can be attempted to check out the C of G.

One problem showed up on initial flights: it was found that the C of G was too far back. This was corrected by adding some weight inside the nose, under the motor, to bring it to the position now shown on the plan, 2¼" (57 mm) from the LE. I had fallen into the trap of not appreciating that brushless motors and modern speed controllers are now considerably lighter than the old brushed motor days! On the plan the nose forward of the wing has now been extended an extra half an inch to compensate.

Simply, if all goes well, just enjoy the flying and seeking out any lift to extend your flight. Be aware that strong lift can quickly take a small model to a height where its orientation becomes difficult to judge. In these circumstances it becomes wise to take action, either by spinning the model down to a safer height or by tracking out of the thermal by moving well away to another part of the sky. It is unwise to attempt to dive out at speed, as this is often the usual cause of wing failure.

Enjoy!

RCMW

Your author prepares his model for its first flight


Ready, steady... push!


The prop folds back nicely in the glide


At height and searching for those thermals

CONTACTS

CHRIS WARD
Email: ca.ba.ward@ntlworld.com

MAYFLY-6E PLAN DETAILS

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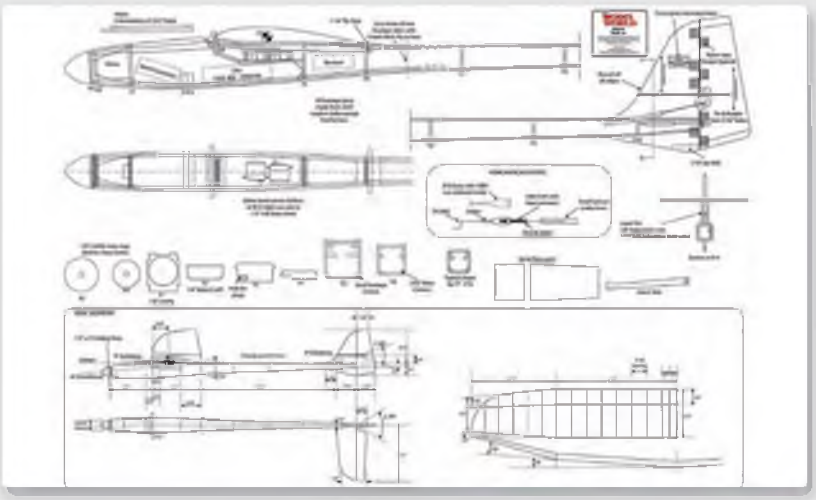


Riot XL

Max Thrust's popular 1.4 m high wing, all-round sport model gets a big sister. Frank Skilbeck takes a look at the new 1.6 m XL version

Parts are supported in foam mouldings within the box

The parts count is pretty low as most of the work has been done. The standard of the mouldings is very good and all decals are already applied

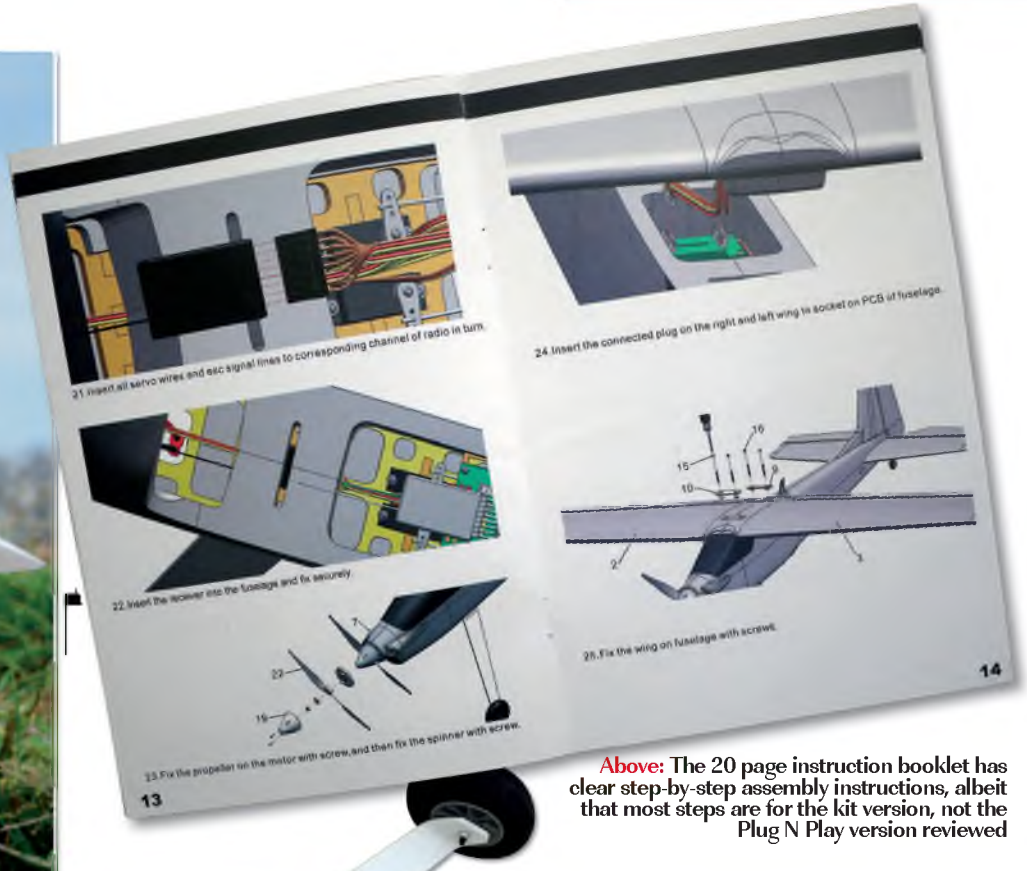
The original 1400 mm wingspan Max Thrust Riot, introduced in 2012, has proved to be very popular. It uses a 3S 2200 mAh LiPo and is well known for its smooth flying abilities, making it a great model for both new and experienced flyers alike.

Now Century UK have decided to go large with the introduction of the Riot XL, increasing the wingspan to 1600 mm, adding flaps, a glider tow release and wingtip navigation LED lights, all driven by a 4S 3250 mAh to 4450 mAh LiPo.

Very Neatly Packaged

The Riot XL is provided in a large colourful box with all the components secured internally in foam carriers, which not only stop the items from moving around but also provide a degree of protection. First impressions are very good; the mouldings are all smooth and sturdy, giving the model a solid feeling, and the motor, ESC, servos and decals are already installed. However, on our example the rudder and elevator servos had been installed 180 degrees out and had to be rotated so the control rods were the correct length.

We got in touch with Century and they advised that this had now been rectified, but as the servos are mounted on a ply plate, using standard servo screws, turning them around was quite easy.



Above: The 20 page instruction booklet has clear step-by-step assembly instructions, albeit that most steps are for the kit version, not the Plug N Play version reviewed

The good quality hardware includes a ready made undercarriage set, suitable prop and wing joiner

The main undercarriage is a durable metal unit with a significant rake, which is required to accommodate the battery bay and hatch in the underside. There's a 20 page colour instruction manual, which goes through the assembly sequence step-by-step. This includes the steps for the kit version, which are already completed in the receiver ready version distributed by Century, so there is very little assembly required. Only needing a couple of Allen keys, it could be easily assembled in under 60 minutes if you don't need to take review photos during the process...

Assembly

Assembly starts by fitting the tail surfaces. The horizontal stabiliser slots into the fuselage and is then clamped in position by the vertical stabiliser, which is held in place by two Allen bolts, which are fitted from the bottom through the tail wheel bracket. It's all very quick, with the parts slotting into position easily.

The control rods from the servos should then be connected up to the control surfaces.

Next up, the main undercarriage is fitted to a sturdy plastic plate just behind the battery bay, again using Allen bolts, the large wheels being already fitted to the undercarriage legs.

The wings slot together on a large diameter composite tubular spar, with a smaller square section spar keeping the wings aligned.

Max Thrust have provided a neat way of connecting the wing servos and wingtip LEDs back to the receiver via a printed circuit board. This is fitted with two JST connectors that the mating connectors on each wing plug into, making assembly at the field fool proof and very easy.

The flap servos are connected together on the board so there is no option to hook the flap servos to separate channels to allow aileron to flap mixing without bypassing this board. But it does mean that only one channel is required for flap operation.

The aileron servos are routed independently, although a loose Y lead is provided if your radio doesn't have sufficient channels for independent aileron servos. The wing servos are fitted with conventional servo plugs, which plug into fly leads on the JST connectors. This not only makes replacing a servo easy if required, but also allows the hook up board to be bypassed, or removed, if required.

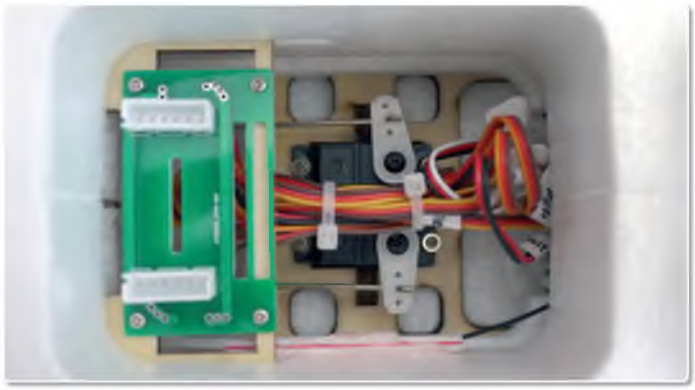
The wing is held in place with four Allen bolts through two plastic brackets, which hold the two wing halves together. So provided you've not forgotten to take the Allen key, assembly at the field is a two minute affair.

Since the flap servos were pre-installed the flaps were level when the servos were centred, so there is equal up and down movement of the flaps. I moved the servo arms around and shortened the flap control rods to allow greater downward deflection for more flap authority on landing.

The receiver is fitted next. The area under the wing is divided into two compartments, with a large ply and foam centre section for the wing securing bolts, and the receiver needs to be installed in the slot under the wing mounting plate. This is a bit tight but

The horizontal stabiliser slots into the fuselage before the fin is slotted in and held in place with two Allen bolts installed from the underside of the fuselage. This clamps both tail surfaces in place so no gluing is required

This neat PCB board provides the receiver hook up to the wing servos and LED lights. All leads are labelled to speed things up



The receiver is fitted in a recess under the forward wing mount. The servo wires have been tie wrapped together to stop them from getting caught on the elevator and rudder servos

As supplied the flap servos are centred and the flaps have up and down movement. So the flap control arms were rotated on the servo splines to give more down deflection

The two wing halves slot together onto a main tubular spar with alignment being assured by a smaller rectangular joiner. Clamps then hold the two halves together when the wing is bolted into place

At the flying field the wing servos and LED lights are quickly connected to the PCB board. There's no chance of getting the servo connections wrong – very neat!

I managed to slot in a 7-channel end pin receiver, with a single layer of bubble wrap for protection. As the receiver connections are not easily accessible when the receiver is in position I found it best to check all controls with the receiver loose using a standard battery pack, before connecting the ESC lead and slotting it into position. All the servo cables are labelled to help when hooking up.

No throws are given in the manual so I left the aileron, elevator and rudder throws at 100%, with a little exponential on the elevator and rudder. The flaps were allocated to a three position switch with approximately 20 and 75 degree deflections.

The end points required adjusting on the tow release, as when using 100% throw in the closed position it caused the whole tow hook to move, straining the servo.

As the servo cables run over the elevator and rudder servos, to keep things tidy and prevent any snagging I tie-wrapped the cables all together.

Powertrain

Once satisfied with the control set up I fitted the 14 x 7 propeller and spinner and ran a power test using an older 3600 mAh 4S battery that had previously had a hard life in an arduous EDF application and was not in prime condition. This showed that after about 30 seconds running the powertrain was developing 400 watts at 13 V and 30.7 amps, which is well within the 50 amp rating of the supplied ESC. A set of luggage scales showed a static thrust of around 3 kg.

As we hoped to do some aerotowing with the Riot XL, and the ESC was well within its capability, I ran the same set up with a 15 x 8 propeller and achieved 470 watts at 12.16 V and 38.7 amps with a static thrust of 3.2 kg.

The recommended battery size on the box is a 2600 mAh 4S battery and I had some 2650 mAh 4S LiPos. But with these the Centre of Gravity was behind the most rearward recommended point and needed 140 grams of lead around the battery to bring the Centre of Gravity within limits.

The Century UK website recommends a 3250 to 4450 mAh 4S battery and this is more realistic, although you'll need to carefully check the size of any batteries bigger than my 3600 mAh 4S packs as these only just fit. The battery bay is 150 mm long, 48 mm wide and 49 mm deep (44 mm including the battery hatch latch). With a 3600 mAh battery the model balanced just behind the mid point of the recommended range.

Into The Air

After waiting for a couple of weeks for a break in the weather and the field to dry out a little, we convened at the flying strip behind the Traplet offices. The grass was still a little long and the strip a bit rough, but was probably similar to many UK flying fields at this time of year. But the sun was making an appearance and there was only a light breeze, even if it was decidedly chilly.

The wings are held in place with four Allen bolts that go through the two clamps that keep the two halves together

Lined up at the Traplet Towers flying strip prior to the maiden. Yes, it was cold!

Despite only having 400 watts on a well-used LiPo the Riot XL climbs strongly away

Colourful decals show up well in the murky conditions

Overhead fly-by with full flap

So with the standard 14 x 7 propeller and a 3600 mAh 4S battery fitted the model was positioned on the strip.

Applying power saw it accelerate smoothly away and into the air in no time. First impressions were that it was very smooth, being responsive but not at all twitchy. After a few low passes for the photographer a few basic aerobatics were tried. Loops and rolls were easy, and stall turns okay but a mental note was made to move the control rod on the rudder horn to give a bit more movement.

The flaps were tried and caused a bit of ballooning, which could be held with a little down elevator, so it was decided to land and add some flap-elevator compensation. The Riot XL proved to be very stable on landing and alighted gently onto the strip.

In the second flight we did a few more aerobatics and low passes. Although the model felt like it could do with a few more watts it was quite happy and would climb vertically for quite some time before running out of steam. It reminded me of a well sorted 40-size IC trainer that we all used to learn on.

After a gentle touchdown, on turning to taxi back at the end of the strip we noticed that the tailwheel bracket had broken, probably caused by a combination of the rough strip and the cold weather. Rather than wait for a replacement tailwheel assembly I decided to fit a separate unit and a few days later we convened at my club's strip, together with a Parkzone 2.25m Ka8 foam glider, as we were keen to test the Riot XL's towing prowess. With the Ka8 hooked up behind, the Riot XL took off in no time and climbed gracefully to a height of around 600 feet in around 60 seconds.

We tried two tow lines and the longer line, about 30 metres long, gave a smoother, more controlled tow. This showed that when correctly set up the Riot XL is easily capable of handling similarly sized gliders and probably a slightly larger and heavier one too, especially if a larger propeller is used to take advantage of the ESC rating.

On a separate day there was a 10-15 knot wind and we were able to carry on test flying the Riot XL with both the 3600 mAh and weighted 2650 mAh batteries. And while it did feel that the Centre of Gravity would benefit from moving forward a tad, and a bit more power wouldn't go a miss, the Riot XL proved to be a very competent flyer, easily capable of flying the full BMFA B schedule. The spin entry was the most difficult manoeuvre, as the XL is reluctant to stall, and even then it only gently drops a wing.

With flap-elevator compensation dialled in the flaps could be used to shorten the take-off and allow a steeper landing approach. On the standard set-up we found that after five minutes flight time the batteries only took some 1200 mAh to recharge, but five minutes was enough for my fingers at this time of year!

Summary

If you liked the original Riot then I think you'll be delighted with the XL. It goes together quickly and makes for an easy going, smooth flying model. It can be assembled quickly at the field and breaks down easily for transportation.

As I noted earlier the flight characteristics reminded me a lot of a well sorted .40 IC trainer. On a buddy box the XL would make a great trainer, and it's also a great all-round hack. The more experienced pilots may feel a bit more power wouldn't go amiss, but as the ESC already has plenty of head room this can easily be accomplished by changing the propeller for one with more pitch and/or diameter.

The flaps and tow release add to the versatility and the model is also fitted with a mounting point for fitting floats for some off water flying.

In short the Max Thrust Riot XL is a fine all round model. ***RCMW***

Author with the Riot XL after the maiden flights

The glider tow release just behind the wing works well

With the Parkzone Ka8 that was used as the guinea pig for aerotowing

On the standard power set up Riot XL easily tows the lightweight Ka8 aloft

Landing with the tow line after a successful glider tow

MODEL WORLD

MODEL INFORMATION

NAME:	Riot XL
MANUFACTURER:	Max Thrust
DISTRIBUTOR:	Century UK
WEBSITE:	www.centuryuk.com
PRICE UK:	£219.95
MODEL TYPE:	Sport and aerotow
ENGINE/MOTOR:	AS3520 KV680
CONSTRUCTION:	Moulded foam

R/C FUNCTIONS

1: Ailerons (dual servos)
2: Elevator
3: Rudder
4: Throttle
5: Flaps (dual servos on a Y-lead)
6: Tow release

SPECIFICATIONS

WINGSPAN:	1600 mm (63 in)
LENGTH:	1287 mm (50.7 in)
WEIGHT:	2450 g (5 lb 10 oz)

Dislikes

Tailwheel breakage

Likes

Flying characteristics • Wing servo connection board • Easy assembly at the field • Built-in tow release allowing aerotowing of lightweight gliders

Details of the model are provided on the box. Century UK's website recommends a 3200 to 4450 mAh 4S LiPo. The 2600 mAh 4S listed will make the model tail heavy

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Design
Designed with the versatility to be updated as and when new and advanced parts are developed. For example, a new heated bed will shortly be available as an optional add-on to the system.

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3D printing is the perfect way to make bespoke scale details for all types of models. The builder of this big 1:3 scale RC model of a Druine D-31 Turbulent aircraft needed to represent the parts of the VW engine that protrude from the side of the cowling. He was able to supply reference photos and drawings of the full-size engine, so creating a 3D printable model was fairly straightforward. He'll need to do some sanding/filling/finishing before painting and detailing it, but it should look just right when installed in the model.

SPECIFICATIONS

Firmware
- Calibration:automatic bed levelling and machine calibration routine
- Layer resolution:0.3mm 0.05mm
- Build surface: Removable bed, uncooled Buildtak print surface (For printing with PLA). Heated aluminium plate available as an upgrade, (allows printing with ABS,PETG, PC, HIPS, and many more).
- Print speed:0.4mm nozzle, up to 16mm3/s
- Motion:Up to 250mm/s, 4000mm/s2 acceleration, segmentation free real time delta movement
- Nozzle:0.4mm diameter, maximum operating temperature 300oC, warm up time 60secs.
- Power adapter:100V/240V, 60W.
- Software:Machine control: On board web interface available via ethernet, USB control also available
- Standalone printing from onboard microSD card

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

Materials
- Standard 175mm diameter filament (PLA Plastic)

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Cosford Restoration Hangar

The Sir Michael Beetham Restoration Hangar based at RAF Cosford opens up its doors for the LMA AGM. Neil Hutchinson is our guide

ROYAL AIR FORCE museum COSFORD

The Sir Michael Beetham Restoration Hangar was opened in May 2002. This small hangar at the back of the main RAF Museum, Cosford houses some very rare aircraft that are in the process of being restored for static display and will eventually find their way museums around the UK. A small team of dedicated technicians and apprentices work on these priceless aircraft and artefacts. At the present time major restoration work is being carried out on a Vickers Wellington Mk X, a Handley Page Hampden and Dornier 17Z.

For a few days every year the hangar is opened up to the public, who can view work in progress on the major aircraft restorations mentioned above, plus other restoration work. One of these open days is set aside for members of the Large Model Association on their AGM Sunday. The LMA have a long association with RAF Cosford and opening up of the restoration hangar especially for the members is a lovely gesture by the Museum.

Dornier

Over the past few years major restoration projects have taken up a huge amount of time. The biggest and possibly one of the most difficult is the Dornier Do17. I first saw this airframe not long after it had been recovered from the sea. The Dornier airframe was divided up in two large poly tunnels that had been erected to decontaminate the Do17 of saltwater and various crustaceans.

The next time I saw it, in 2014, the airframe was inside the restoration hangar. It was interesting to see how the different materials had fared after so many years in the sea. The aluminium was in a very poor state, while the steel parts were very good. The same could be said of the remnants of an engine. The stainless steel exhausts were like brand new, once they'd been cleaned. The steel parts were rusted, but the alloy block was in very poor condition.

The condition of the Dornier airframe is very fragile, due to its long immersion in the sea. Looking at the deteriorated, wafer thin aluminium structure it is a wonder how they managed to bring it up from the seabed to dry land – a testament to the skill and professionalism of the people involved in the project.

It was November 2014 when I actually saw the Dornier. The large parts such as fuselage and wings were still in their original frames. There were many fragments that would need identifying. By the time I saw the Dornier again in 2015 it was out of its original frame and looking more like a fuselage and wings. Many of the steel parts have been cleaned and many of the moving parts still work.

Two other long-term restorations, which have taken a bit of a backseat during the Dornier work, are the Wellington and Hampden. Over the past few years little seems to have happened. However, just like building a large radio controlled model aircraft, all those little bits come together and suddenly lots seem to have been done. The wings of the Wellington are now back in the hangar, fully cleaned and repainted and almost ready for recovering. The geodetic structure looks superb in its dark grey painted finish. The fuselage has had the rear turret removed and most of the old fabric has also been removed. The interior has also been cleaned, too, although the cockpit still looks a bit of a mess, but you can see positive progress and I think it will only be a matter of time before it is back in pristine condition.

The Handley Page Hampden, P1344, served with 144 Squadron, part of Coastal Command. It was shot down by Messerschmitt Bf 109s near the Kola Peninsula in 1942. The Hampden was recovered in 1991 and the RAFM took possession of the remains in 1992. This has been a very long-term restoration, however things seem to be moving on at a greater pace. The tail section looks to be almost complete. The fuselage centre section has been fully patched up and refurbished. I could even see the Tx 1154 and Rx1 155 radio sets inside the fuselage. The front section of the fuselage was too badly damaged and so a new one is being constructed and will use parts from the original front end.

Another airframe that is being restored is a unique German WW1 aircraft – the LVG C.VI. The aircraft was developed by Luft-Verkehrs-Gesellschaft (LVG) and is one of only three survivors. It first flew in 1917 and became operational the following year. It features a semi monocoque wooden fuselage and a water-cooled Benz Bz IV 6 cylinder engine. The radiators are mounted in the wing centre section. The LVG fuselage looks to be in fairly good condition.

Sir Michael Beetham

While I was writing this article I discovered that Sir Michael Beetham passed away in October 2015, aged 92. Sir Michael joined the RAF in 1941 and flew with 50 Squadron RAF, flying the Avro Lancaster. He took part in many big raids over Germany before being 'rested' as a flying instructor. He returned to operational flying at the end of the war and took part in Operation Manna, supplying food to the Dutch. Sir Michael worked his way up through the ranks and finally became Marshall of the RAF in May 1977.

The Restoration Hangar at Cosford is an interesting place to visit. As previously mentioned it is only opened up to the public for a few days a year. I would highly recommend a visit on one of these occasions because the artefacts in there, and the process of restoring them, are very interesting. ***RCMW***

DORNIER DO17

One of the cylinders from the Do17's Bramo 323P 9-cylinder radial engine (2014)

Metal artefacts found inside the fuselage (2015)

Looking at the front of the fuselage. The fuselage is inverted; this is how it was recovered from the seabed (2014 & 15)

A closer look at the inverted fuselage front end (2014)

Looking a bit like a scrapyard. The Do17 airframe has recently come out of the decontamination poly-tunnels (2014)

The aluminium airframe is in a very fragile state and it needs lots of support (2014)

The Bramo 323P with a complete propeller unit (2015)

Unlike the aluminium parts, the steel parts have weathered very well (2015)

Much of the aluminium wing skin has corroded away (2015)

A closer inspection of the tyre shows it to be in fairly good condition (2015)

A closer look at the wafer thin aluminium skin on the fuselage. The drawing shows how the Dornier looked originally (2015)

HAMPDEN

This picture was taken in 2012 and shows the still heavily damaged rear fuselage, butted up to the repaired centre section

The Hampden's Bristol Pegasus XVIII 9-cylinder radial engine. Part of its undercarriage is in the background (2014)

Work still being carried out on the underside of the fuselage (2014)

A closer look at the fuselage underside (2014)

The tail section in 2014

The almost complete tail section in 2015

The original front/cockpit section was quite badly damaged. This is the new front end being rebuilt (2014/15)

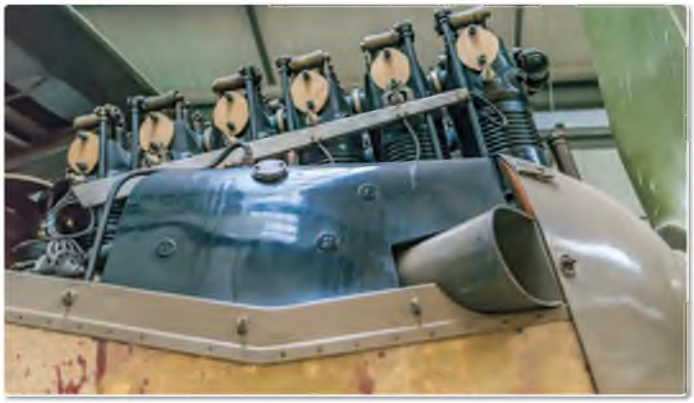
Remains of the original cockpit section (2015)

Panoramic view of the Hampden work area (2015)

Looking inside the fuselage. The wireless operator's station can be seen complete with Tx 1154 and Rx 1155 at the back (2014)

LVG C VI

This picture was taken in 2014 before the restoration work began. One of the unique features of the LVG was its water-cooled engine. The radiator can be seen in the small bit of upper wing centre section



A close-up of the Benz Bz IV 6-cylinder water-cooled engine (2015)

The old coverings have now been stripped off and work on the wood can begin. The LVG does look in fairly good condition for its age (2015)

The cockpit looks very primitive but looks in good condition

The wings have been stripped of their fabric and these too look in fairly good condition (2015)

MISCELLANEOUS

A good example of how different metals deteriorate in the sea over time. What looks like the remains of a Napier Sabre engine? The 2014 picture shows how it was originally. In the 2015 one several parts have been cleaned. The stainless steel exhaust stubs look like new, whereas the alloy block has deteriorated very badly

One of the more recent restorations out on show, the Hawker Siddeley Kestrel F(GA) 1 (2015)

The Kestrel under restoration in 2012

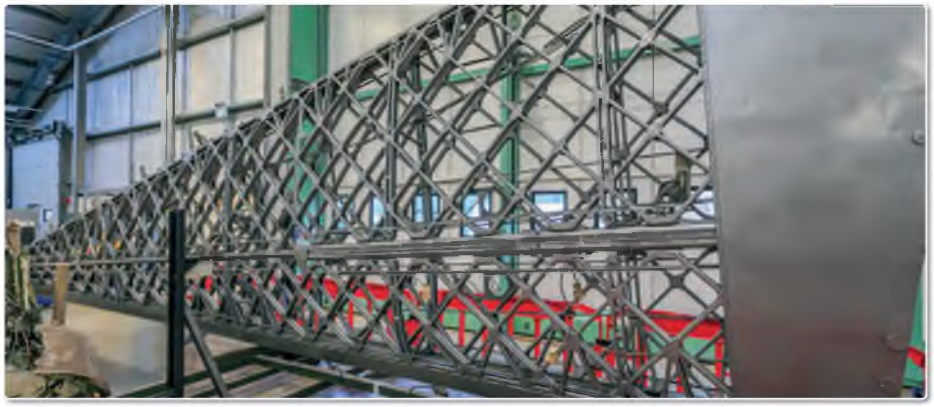
This Spitfire Mk XIX is soon to go out on loan to a foreign aviation museum (2015)

WELLINGTON

The Wellington cockpit in various states. You can see the improvements from 2012, 2014 to 2015

The tailplane and wings before they were cleaned up and repainted

A wing after being repaired



Above & Top: Views of the repainted wing, which is soon to be recovered

The fuselage as I first saw it in 2012. The canopy and Perspex side windows are still attached

The fuselage as it is now (2015)

A closer look at the front turret

The rear turret in 2012

A look inside the rear turret in 2014, which is still attached to the fuselage

The rear turret had been removed when I saw the Wellington in 2015. The interior of the fuselage looked a lot cleaner, too

The navigator's workstation (2015)

The wireless operator's workstation

Looking forward from the wireless operator's workstation

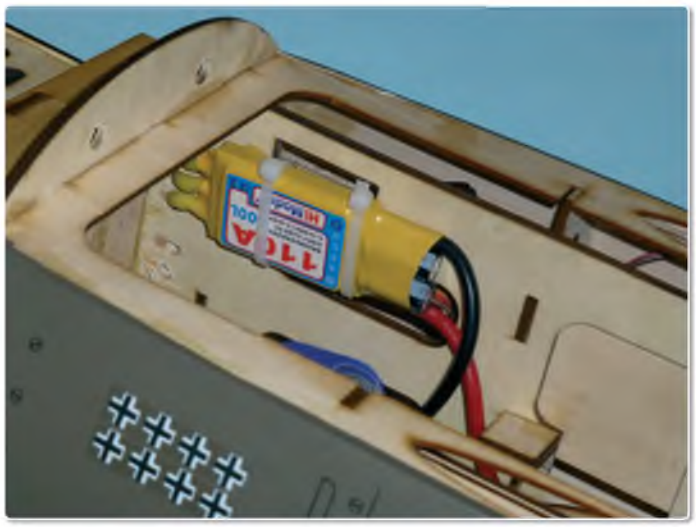
The starboard wing centre section (2015)

Going Large With Electric

Brian Collins looks into powering larger models with electric power and making IC to EP conversions

Vulcan bomber during a pass – looks great, sounds great and is 'all electric'!

Dualsky XM5060EA-8 Brushless Motor is a replacement for a .60 IC engine, producing up to 1500 watts



HiModel 'Cool' ESC as used in the author's Hangar 9 P-47. Rated at 110 A, it provides plenty of current 'redundancy'

We all know the benefits smaller models offer, being easy to transport and store. Construction costs are cheaper and they are generally easier to repair should a mishap occur. However, there is no doubt that building and flying a larger model has benefits too!

Larger models carry a lot of 'presence' in the air, are easier to orientate whilst flying and have the benefit of not being affected by wind or turbulence as much as smaller models. But is selecting a powertrain for larger model aircraft harder than their smaller counterparts? Not necessarily, provided a few guidelines are followed.

Powertrain Selection

The selection and installation of any electric power set requires a number of choices in exactly the same manner as selecting an internal combustion engine. However, with an electric system there is more than one component that needs to be selected and which can make all the difference to performance: Electric motor size, ESC selection and battery size and cell count all need to be considered (as does the correct propeller). These are the same for any electric model of course but as long as you choose correctly your larger model will perform just as well as any IC model. And in many cases, better!

Motor Choice

Whether it is a new model that has been specifically designed for electric power or an IC model I am converting to electric, I always select the motor first. There are a plethora of electric motors available, so much so that many people worry about selecting the right motor to the extent it can put people off electric power altogether.

However, the table below will provide a guide as to the amount of power a particular model requires. The trick is to select the correct power rating for the model's weight. I find the table works just as well for large models as it does small lightweight foamies.

Electric motor power output is measured in watts. Motor manufacturers and retailers should state the power output (in watts) of a particular motor when they sell it. Personally I stay clear of manufacturers/sellers who don't bother to show electric motor power ratings.

POWER TO WEIGHT GUIDE

80 watts per pound
Trainers and slower flying scale

100 watts per pound
Warbirds and aerobatic

150 watts per pound
Lightly wing loaded 3D, fast models, scale EDF

200+ watts per pound
Vertical 3D models, high speed EDF

This 20 A SBEC unit from Castle Creations can be used to power receiver, servos and ancillaries, powered direct from the flight battery

Receiver battery packs can be used to power receiver, servos and ancillaries – and can help achieve the correct C of G too!

OPTO ESC's only provide power to the model's electric motor, requiring a separate power supply to run the receiver, servos and ancillaries

Adjustable metal motor mounts are ideal for mounting large brushless motors

I select a motor which will produce the power I require at less than full throttle. If a motor is rated at 500 W and I need 500 W to power my model I will select a motor rated at least 600 W (or even 700 W) so it is not running at maximum power levels. Electric motors have an efficiency rating that is definitely not obtained at full throttle so it is always best to have more power than actually required. This helps increase efficiency and flight duration in particular.

TOP TIP

In order to obtain actual power input use a Watt Meter. It is virtually impossible to accurately set up an electric power train by simply guessing, and you most certainly do not want to guess when powering a large model. So use a Watt Meter and remove all guesswork!

Motor Mounts

There are several commercial motor mounts available for large brushless electric motors. Some feature additional bearing support for heavier propellers and spinners (see photo). Many large ARTF kits which have been specifically designed for either IC or electric power are supplied with a motor mount in the box. Each installation is different of course but sometimes all that is required is a simple ply box constructed on which to mount the motor further forward than its IC counterpart.

Giant Jugs!

I built a Hangar 9 P-47D-1 Thunderbolt 60 with an electric power system. The manufacturer stated the AUW (All Up Weight) as 4.7–5.2 kg (10.3 – 11.5 lb) so I take the heaviest weight and using the power to weight guide for a warbird. I see that I require a power rating of 100 W per pound, and from that I calculate that a minimum of 1150 watts is required (11.5 x 100 W per pound).

So with this in mind I selected the Dualsky XM5060EA-8 brushless outrunner, which is rated at 1500 watts running on the recommended 6S (22.2 V) LiPo battery pack. This means that I should have plenty of power in reserve and at cruising speeds the motor is not at full throttle, meaning it is more efficient, which in turn gives cooler running and better duration. By the time my particular 'Jug' was ready to fly she came in at closer to 5.9 kg (13.0 lb).

Electronic Speed Controller

The next item in the powertrain to consider is the Electronic Speed Controller (ESC). Like my motors I always buy larger ESC's than the figures would suggest is required so they are not operating to maximum capacity.

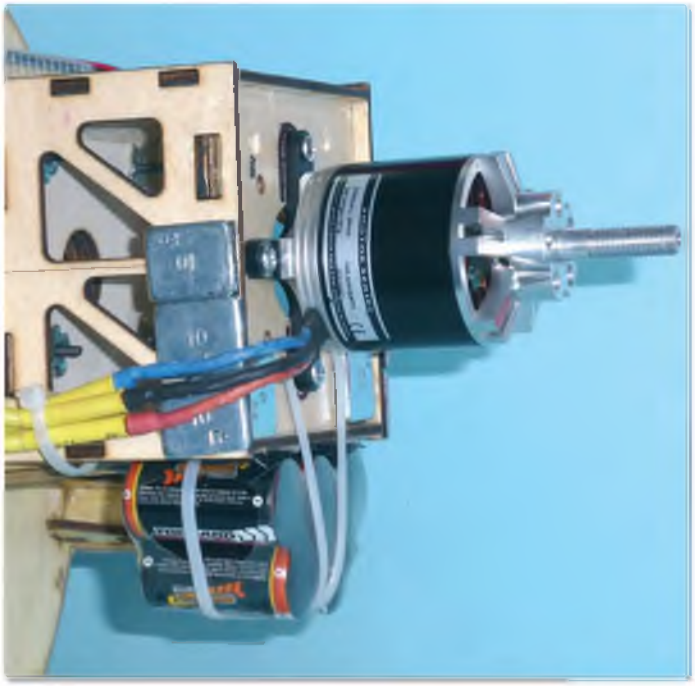
In the case of the Hanger 9 P-47, I know I have selected a 1500 W motor and with the recommended 6S LiPo pack producing 22.2 volts of operating voltage I can calculate an ESC of at least 67.56 amps is required (Power divided by Voltage = Amps: 1500 W/22.2 V = 67.56 A) so I will use at least an 80 A ESC to give some 'redundancy'. As it happens I had a 110 amp HiModel 'Cool' ESC in the spares draw so that was used.

BEC Or Battery?

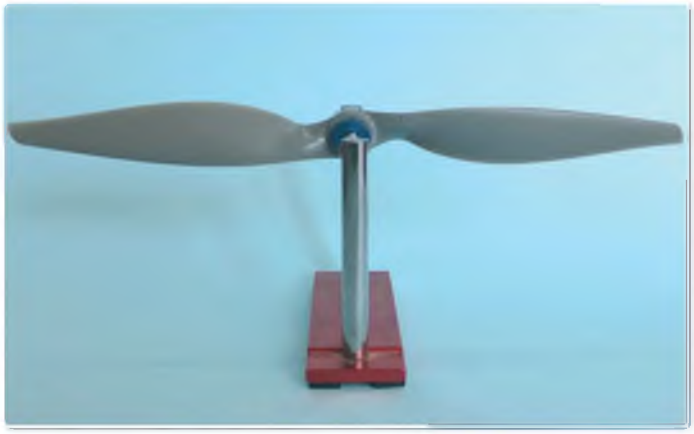
Without doubt the most common question I'm asked when people are contemplating powering large models via electric is: "When do you use the on-board BEC (Battery Elimination Circuit) or separate BEC or a dedicated receiver battery?"

Personally, I never use a built-in BEC when using battery cell counts of more than 3S (11.1 V), which you will definitely need when building a larger model. Why, I hear you ask? A built-in BEC (by built-in I mean using an ESC which has the BEC built-in to the ESC circuitry) becomes less efficient the higher the input voltage. If we take an ESC which runs a 6S LiPo (22.2 V input voltage) the BEC has to 'step down' said 22.2 V to a working voltage of 5 V or 6 V to power the receiver, servos and other ancillaries, meaning it will generate more residual heat within the ESC as heat is generated when dissipating unwanted energy.

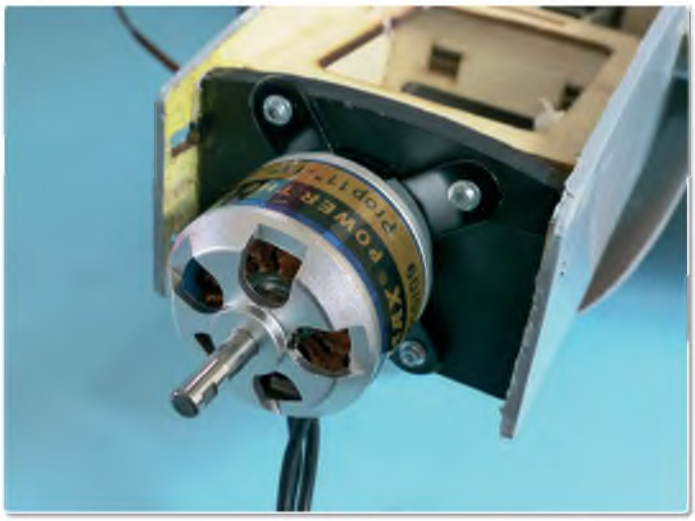
If you have an ESC that has a built-in BEC but you do not wish to use the BEC you can disable it by removing the red wire from the receiver plug. However, do NOT do this if the ESC is an OPTO unit as it has no BEC to disable!



Mounting a receiver battery pack forward helps obtain the correct C of G, however additional weight may still be required!



Balancing propellers is vitally important. Unbalanced props cause excessive wear on motor bearings



Brushless electric motors have the ability to swing larger propellers without the need of a gearbox

LiPo battery packs can be wired in 'series' to increase voltage and 'parallel' to increase capacity

A Watt Meter is a 'must have' tool for setting up electric power systems. It removes all the guesswork

With larger models utilising more servos and additional features such as retractable undercarriages, lights, sound, bombs and other ancillaries, I tend to err on the side of caution and use either a separate U-BEC/S-BEC that has been specifically designed for higher input voltages, or I use a receiver battery.

Indeed I am now using a dedicated receiver battery in all my larger electric models for a number of reasons. As well as powering the receiver, servos etc., a receiver battery can also help achieve the correct C of G balance in larger models (particularly with IC to electric conversions), as an electric motor does not weigh anything like as much as its oil burning counterpart!

Many pilots choose to use a separate BEC that is powered from the flight battery pack as they are lighter than a receiver battery. Indeed this is a very good option if nose weight is not an issue. However, after having one fail mid-flight (with the resulting loss of the model) a few years ago, I now always have the worry that if the separate BEC fails the model is destined for the bin bag collection services of my fellow flyers!

However, modern BEC's are very reliable and some people would argue that receiver batteries can also fail mid-flight. But personally I feel confident using a separate receiver battery pack to power the receiver, servos and ancillaries in my larger models.

In the case of the Hangar 9 P-47 I initially used a 2200 mAh 5-cell 6 V 'AA' NiMH receiver pack but found it still required a lot of additional nose weight to achieve the correct C of G. So rather than add lead weight (or today's non-poisonous equivalent) I replaced the 2200 mAh 5-cell 6 V 'AA' pack with a 3300 mAh 5-cell 6 V 'Sub C' NiMH battery pack, which as well as providing bigger capacity helped achieve the correct C of G due to its additional weight.

Flight Battery Pack Selection

Once the motor and ESC selection has been determined I choose the battery packs I want to use. As with the motor I always select the highest capacity cells/packs I can find (or afford) so that the flight battery is not discharging near its maximum capacity. This not only offers better duration but longer battery cycle life.

When it comes to battery selection it is also worth thinking what models you have to hand and possibly try to think of what models you will be purchasing at a later date. For instance, I have a very nice, four engined (motor) 72" span B17, which I fly on a single

5000 mAh 3S (11.1 V) LiPo battery. However, the Hangar 9 P-47 uses a 6S (22.2 V) LiPo battery, so instead of buying 6S packs for the P-47 I simply wire two of the 5000 mAh 3S packs in series to create a 6S battery pack for the P-47. This means I can use the packs to fly both models. As battery bay space tends not to be an issue with larger models there is plenty of space for any additional wires to be accommodated.

Perfect Propellers

As with small electric models correct propeller selection is just as important with larger models. A propeller can make a big difference to the current draw of an electric motor. In the case of the Dualsky XM5060EA-8, as used in the Hangar 9 P-47, Dualsky recommends a propeller between 16" x 10" to 16" x 12" with a 6S battery. Using a XROAR 16" x 10" propeller my Watt Meter recorded 1100 W of input power with a current draw of 53 A. However, by changing the prop to 16" x 12" the power increased to 1450 W. That's a massive 350 watt power increase just by changing the pitch by two inches! Obviously the current draw increased accordingly and in this instance it went from 53 A to 71 A, which is why a Watt Meter becomes essential as it removes any guesswork. My 110 A ESC will be perfectly adequate but a 71 amp current draw would affect duration somewhat.

This is another reason to use a Watt Meter; by running the motor with different propeller sizes it is easy to 'fine-tune' the powertrain As we have seen even an inch or two in prop pitch can make a substantial difference to current draw, affecting overall performance and duration accordingly.

Always balance propellers prior to use. Even brand new props straight out of the packet can be well 'off balance'. An unbalanced propeller can not only be a danger but will absorb a lot of power from the motor, not to mention put extra stress on bearings, mounts and firewalls, so always ensure that propellers are correctly balanced prior to use.

Conclusion

I hope this feature has provided some useful tips and information, making you more confident when contemplating building a larger electric model project or an IC to electric conversion.

There is no doubt the rewards of flying large electric model are immense, as is the satisfaction of knowing you selected the correct components. So why not have a go yourself? I am sure you will be very pleased you did. And don't forget to send in your pictures, along with details of your larger electric models to us here at: ***RCMW***

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DUALSKY
www.dualsky.com

CASTLE CREATION
www.castlecreations.com

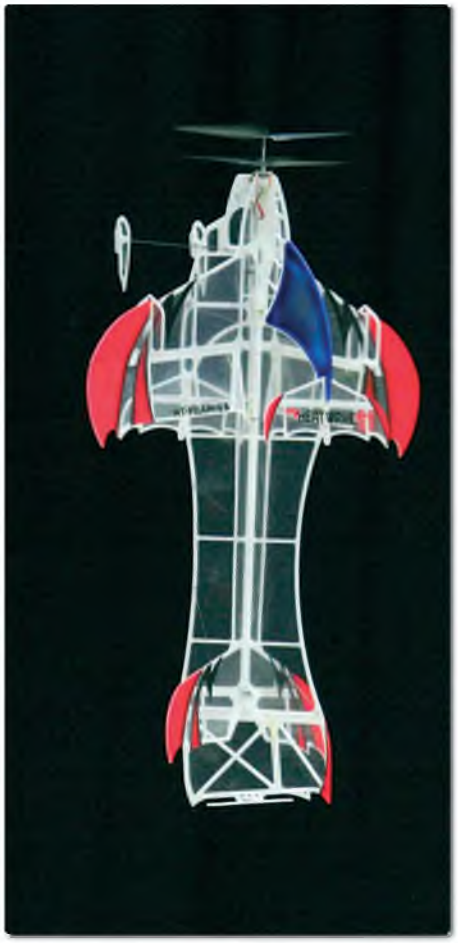
The author's electric Hangar 9 P-47 Thunderbolt leaps into the air following a very short take-off run – even at over 5.8 kg (13 lb)

Hangar 9 P-47 Thunderbolt on a fast low pass. Plenty of power on tap!

My large Vulcan bomber has a wingspan approaching eight feet and is powered by a single 120 mm fan running on 10S LiPo battery pack

BMFA Electric Indoor Masters 2016

'Indoor Flying at its absolute best' was the verdict of pilots and spectators who attended this year's Electric Indoor Masters. Paul Wilcockson reports, with pictures by Mark Wilcockson



MT Foamies Heatwave, designed and built in the UK

Carbon Victory's ready for the challenge ahead

The Elanor from AlanRCfly, the most popular model at the event

Liam Clayton focuses on his inverted Elanor

The event was held over the weekend of February 13th and 14th, in deepest darkest South Yorkshire, at the Barnsley Metrodome Arena. This superb venue, hosting the event for the third consecutive year, proved a fantastic backdrop for an action packed weekend of indoor flying that attracted pilots from all corners of the country and across the channel.

It was pleasing to see EIM regulars, like Dutch aces, Derk and Bert Van der Vecht, making the trip over the water to pit their skills against our home grown talent, including a number of new debutants to the competition.

This swelled the total number of participating pilots to 23, making it not only a truly international competition but probably the biggest competitive R/C aerobatic event in the country.

The 'Masters' features seven classes of competition, which always ensures that the event produces an action packed weekend, featuring some of the best flying to be seen anywhere. The events are: F3P 'C' schedule, F3P 'B' schedule, F3P 'A' schedule, Aeromusical, Freestyle, Team Freestyle and Pylon Racing.

F3P Schedules

This represents the more traditional style of aerobatics where pilots fly a sequence of the same known manoeuvres in front of a panel of judges. The emphasis here is on the precision of each manoeuvre. The increasing level of complexity in each of the classes ensures that whilst the 'C' schedule could be accomplished by the average indoor flyer, in the top class 'A' schedule there is more than enough to challenge even the most skilled of indoor pilots.

Aeromusical

In this event pilots are free to fly a choreographed routine to music of their own choice. Most people are stunned when they first witness some of the incredible routines

that the top pilots are able to perform and even many of the seasoned competitors are left shaking their heads in amazement at the level of flying skills on display.

Freestyle

During this event pilots have to fly to music as in 'Aeromusical', the big difference being that the audio track is selected at random by the pilot just before he makes his flight.

Team Freestyle

Team Freestyle, like individual Freestyle is all about crowd entertainment and fun. It's not necessary to perform well-choreographed flights, although pilots should attempt to reflect other members' activities.

Pylon Racing

Pylon racing is always a huge favourite with spectators and pilots alike and for this year's event the rules on model choice had been relaxed, allowing for models of any design to be flown but complying to minimum specifications and only being built from 5 mm EPP foam or thicker. The maximum weight of motor was limited to 15 grams and only one choice of propeller, namely a GWS 6 x 3.

Saturday's Events

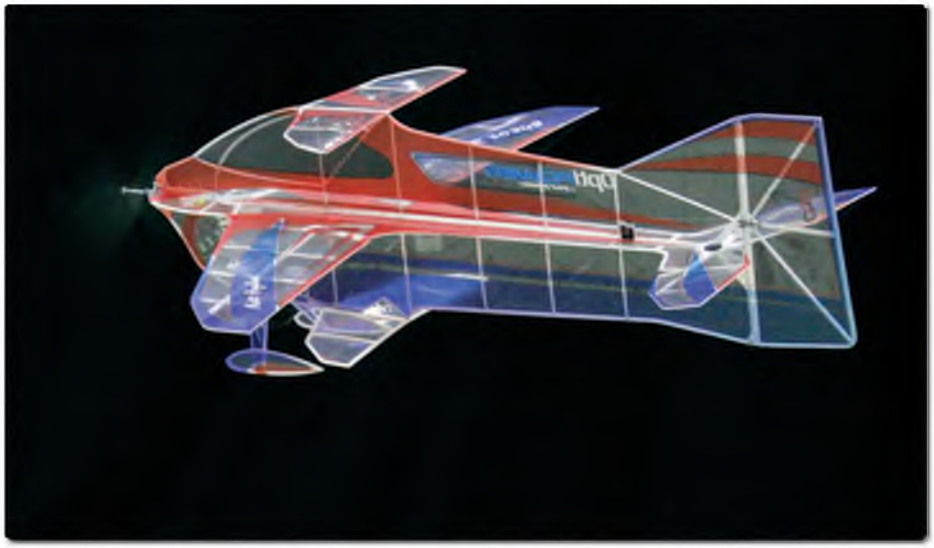
The competition started early at 9.00 am on the Saturday morning with the first round of the F3P 'B' schedule being contested by five pilots, with Max Stringer being the first pilot to fly. John Gaynor took the first round with his 'Elanor' 2015 model, followed very closely by Mark Taylor with his own design and kitted 'Heatwave' airframe, with local Paul Ellis not too far behind in third.

The nine expert class A schedule pilots were next to take to the air and produced some amazingly accurate, smooth and graceful schedules, demonstrating why they are amongst the world's best pilots when it comes to tackling the newly introduced 2017 FAI schedules.

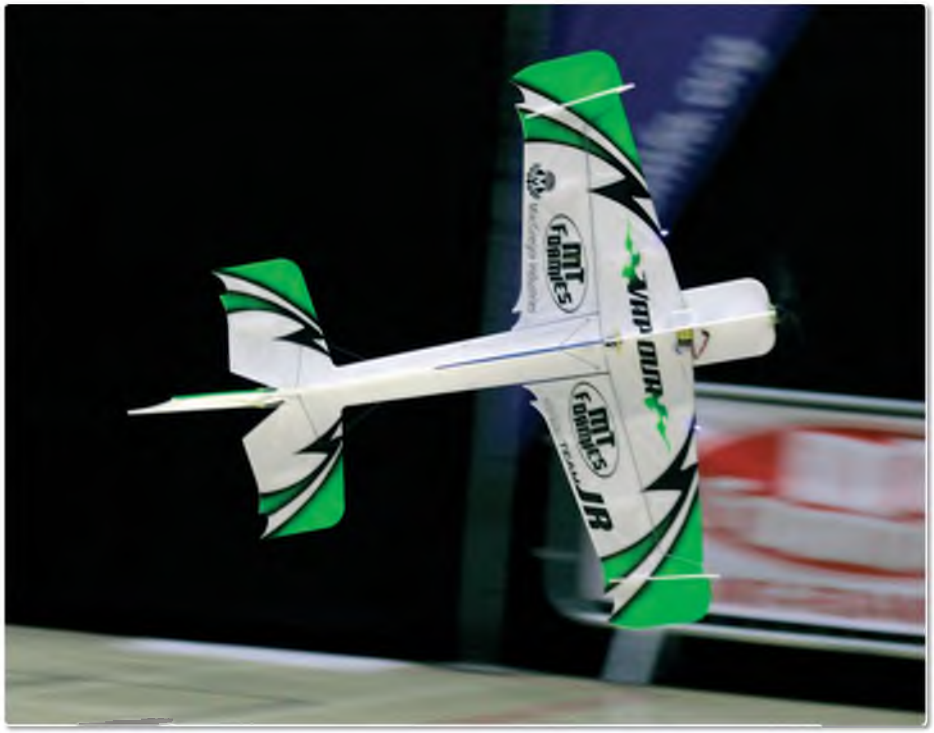
Watching the pilots guide their super lightweight mylar covered models through the sequences was simply mesmerising to watch. The pace of which these models have been developing is equally amazing, with four of the pilots choosing to fly fully carbon framed 'Victory' models, which are designed and produced in partnership by Russian, Alexey Lantsov and F3P aerobatic legend, Donatas Pauzuolis. These planes weigh between 45 and 38 grams with contra rotating propellers running off a 120 mAh 1S battery! Only last year the lightest models were weighing around 80 grams and two years ago they were more than 90 grams so the rate of progress can be seen.

It was no surprise that Derk Van der Vecht was setting the standards in the early rounds, but he was being pushed hard by the UK's up and coming stars in the shape of Liam Clayton, Connor Stephenson and Steve Schafer. To the untrained eye the flights looked very hard to separate but Dutch ace Derk was just more polished and more consistent with his speed and roll rate in particular.

The thing that really seems to separate the top pilots from their peers is the way they utilise the space in the hall to maximum effect, flying at times just inches from the walls and ceiling, enabling them to execute each figure with an incredible amount of precision and gracefulness.



Both Matt and Ashley Hoyland campaigned Gernot Bruckman designed Trivia's



In Freestyle the Vapor from MT Foamies was a popular choice

The 'C' schedule represents the most basic level of F3P that is flown in the UK and consists of a sequence with nine known figures being marked by the panel of judges. All nine pilots in the class made promising starts and it was clear from the onset that the standards had improved massively from those seen in previous years.

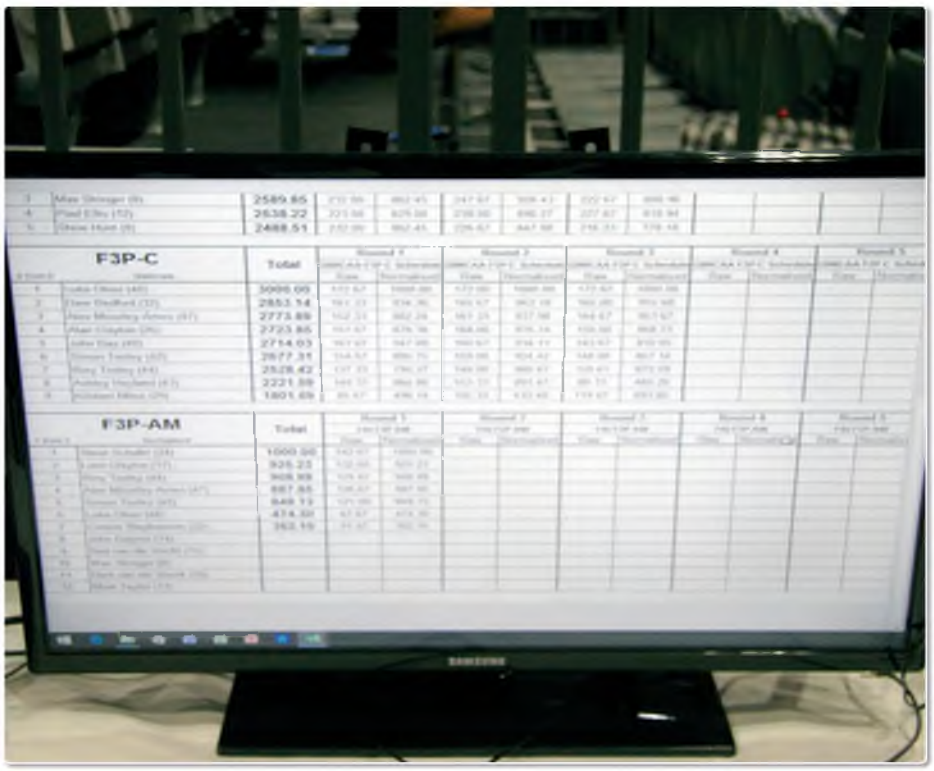
GBRCAA league leader Luke Oliver was again the one to beat, being pushed hard by newcomers Dave Bedford and Alex Moseley-Ames, who displayed no noticeable nerves as the watching crowds started to increase in the morning.

This class has always been closely contested and it was great to see several of the youngsters, including Rory Tooley and Kristen Milne, helping each other with calling duties as they battled the somewhat more mature pilots in the form of John Day and Ashley Hoyland. Ashley was the oldest competing pilot at the event; he is however no stranger to competition flying having competed as far back as 1963 in the 'Nationals' Control Line Gold Trophy.

Another popular plane in Freestyle was the Twisted Hobbies Edge 540, displayed here by Steve Schafer

The pits area was busy all weekend

Judges focusing on scoring using the new iPads, which proved a great success



Instant scores for the competitors and spectators alike

Bert and Derk focusing in F3P AP

By late afternoon all pilots had flown four rounds of their respective schedules and all classes were being tightly contested.

Luke Oliver was leading the pack in the 'C' schedule. John Gaynor was sitting pretty on top of 'B', whilst Derk Van der Vecht was managing to maintain his lead in the 'A' schedule.

Sunday´s Events

Sunday morning started early with two final rounds of F3P schedules being flown by all pilots.

The expert pilots in F3P A had to fly the new 'AF' schedule for the final two rounds, which is really another step up in difficulty from the 'AP' (preliminary) schedule, featuring complex figures such as the appropriately named 'Double Fighter Turn' and 'Clover Leaf'.

For many of these pilots this was one of the first opportunities they have had to fly the 'AF' schedule in a competition environment this season and one or two uncharacteristic mistakes were made in the first round.

Derk van Der Vetch continued to dominate, showing no signs of nerves or pressure. He flew a nearly perfect schedule with his carbon 'Victory', which looked super slow, especially in the down lines where the braking effect from the large 12 inch contra rotating propellers was noticeable

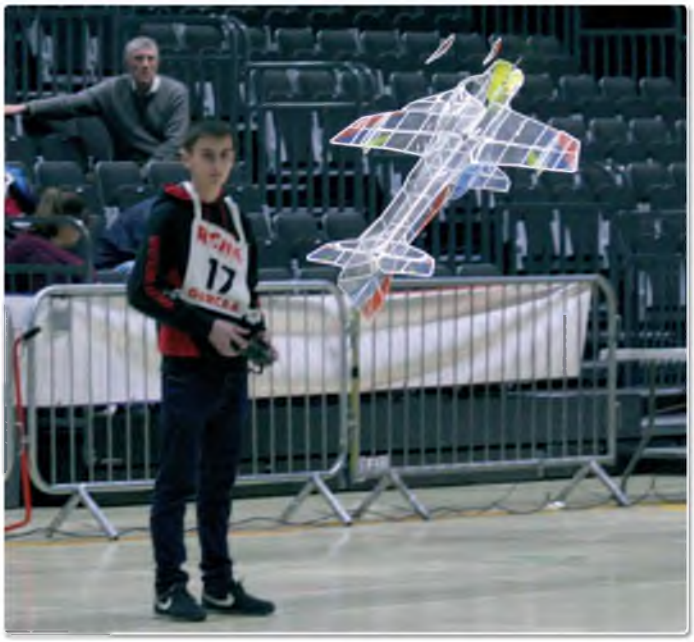
Connor Stephenson was the pick of the British pilots and was pushing Derk all the way, delivering two impressive 'AF' schedules with his MT Foamies 'Heatwave' that was probably twice the weight of the new carbon 'Victory'.

Steve Schafer and Liam Clayton also performed well in the morning's 'AF' schedules and will no doubt be part of the UK team for the next F3P World Championships in Strasbourg next year.

By early afternoon the F3P schedules across all the classes had drawn to a tense conclusion, leaving the pilots scrutinising the judges' scores.

Derk Van Der Vetch was again the top pilot in F3P A, followed by Connor Stephenson in second place and Liam Clayton claiming a well deserved third place on the podium.

Victory in the 'B' schedule was taken by John Gaynor by an extremely narrow margin from Mark Taylor, both pilots having been



Liam Clayton on his way to third in F3P A

Luke on his hoverboard and Rory observe the spectators voting

Derk finishing his Aeromusical flight with his Arrow

Team BD in prefect synchronisation

Team Freestyle allows the use of props and streamers

ultra consistent all weekend. It was fantastic to see the upbeat Max Stringer achieve a well-deserved overall third place.

Luke Oliver dominated the final round of the 'C' schedule, to take overall victory and continue his recent run of good form. Dave Bedford finished a close second, with newcomer Alex Mosleley-Ames making it onto the podium in third.

Freestyle

The Freestyle rounds were slotted in between the schedules on both days, featuring a 'knock out' style format, which has proved popular with both the crowds and pilots in previous years. Two pilots are allocated a colour, red or blue, and select a random music track to fly to by selecting a number ball from a bag. At the end of the round the spectators hold up a blue or red card to indicate which pilot they think should progress to the next round.

The semi-final rounds saw probably the biggest shock when Derk van der Vecht was knocked out by local pilot Liam Clayton, who flew a brilliantly improvised routine to Wigfields 'Saturday Night', just pipping the Dutchman by three votes.

The other semi-final was equally entertaining, and as closely contested, as Connor Stephenson battled it out against crowd favourite, 11 year old Rory Tooley, with Connor, eventually coming out on top by 24 votes to 19.

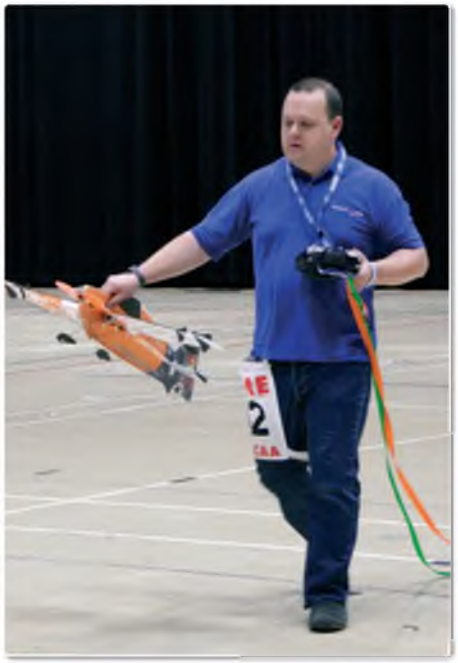
This set up an eagerly anticipated final between Connor and Liam, which proved to be a classic, with both pilots demonstrating why they are amongst the best Freestyle pilots in the UK. It was Connor Stephenson that came out triumphant once again, making his MT Foamies 'Vapour' absolutely dance to the pounding beats of 'Uptown Funk'.

Luke Oliver also caught the attention in the Freestyle rounds, starting his routine on a hoverboard, which I admit looked rather cool and was met with rapturous applause from many of the spectators.

The Aeromusical event this year was contested by twelve pilots and again saw polished and novel routines being delivered across the board. However, it was once again Derk Van der Vecht that set the standards of the weekend with a beautifully polished routine, which had aggression,

MT Foamies Vapour – a popular plane

Even the best of the best get it wrong sometimes and need to repair between rounds



Simon Tooley of 'Britain's Got Talent' fame!

Carbon Victory's need protection when being transported. The box took around 30 hours to complete

Author Paul Wilcockson campaigned an AlanRCfly Giles in Freestyle

The Dutch contingent of Bert, Derk and Dick – superb supporters of this event

speed and complex manoeuvres mixed with sections of smooth graceful flight. All were totally choreographed to his music to form a winning combination for the Dutch pilot.

Connor Stephenson claimed second place, with Bert Van der Vecht not letting the youngsters have it all their own way with a very creditable third place.

Team Freestyle

The Team Freestyle event was contested by six teams all vying for top honours and bragging rights in an event where entertainment value counts. The event was again held in a 'knockout' format, with the crowds acting as judge and jury.

Dutch F3P experts Derk and Bert Van der Vecht – 'Team BD' – were clearly well rehearsed, performing a breath-taking routine with their slow flying 'Disney" models in almost perfect synchronisation with each other. They found themselves contesting the final against local Sheffield pilots Matt Hoyland and Steve Hunt. The Yorkshire duo put on an impressive performance, flying a well timed and flowing routine with matching 'Trivia' models. But at the end of the day they just couldn't match the Dutchmen, who once again were victorious.

Pylon Race

Mark Taylor took a well-deserved first place in the popular Pylon Racing event, which adds a massive fun factor to the weekend. Close on his heels was young Alex Moseley-Ames, with third place being claimed by Adam Lomax.

Memorial Flight And Prize Giving

Connor Stephenson, as is traditional, flew the 'Katie Anne Whitehead' memorial flight with his 'Heatwave' and produced a majestic flight that had everyone completely enthralled.

The famous EIM raffle was drawn before the prize giving, with some brilliant prizes being provided by the generous sponsors.

Finally, the prize giving concluded another fantastic weekend at the BMFA Electric Indoor Masters.

Connor Stephenson was delighted to be selected as BMFA 'Northern Area Trophy' winner. The 'Katie Anne Whitehead' Pilots Choice Trophy was awarded to Matt Hoyland in recognition of all his hard work, not only as Contest Director but as Master of Ceremonies on the microphone all weekend.

An extra special thank you must go out to all the people that made this event possible. The BMFA, GBRCAA and all the kind sponsors that gave so generously. The judges, the scribes and scorers, in particular Matt Hoyland, Steve Hunt and Helen Grainger, who ensured everything ran like clock work all weekend.

To conclude it was another amazing 'Electric Indoor Masters' weekend. The standard of flying on display was simply breathtaking. The quality of those competing gets higher each year, especially with our own home grown pilots making great improvements to enable them to compete with our European counterparts.

The message is clear; the future for F3P in the UK is very bright, with young talents Liam Clayton, Steve Schafer and Connor Stephenson shining through.

It is also clear that the BMFA Electric Indoor Masters is fantastic fun! If you never been or flown in the event you are missing an absolute treat.

RCMW

Pylon podium – 1st Mark Taylor, 2nd Alex Moseley-Amex and 3rd Adam Lomax

Team Freestyle – 1st Team BD, 2nd Team Rolls and Royce and 3rd Team Low and Slow

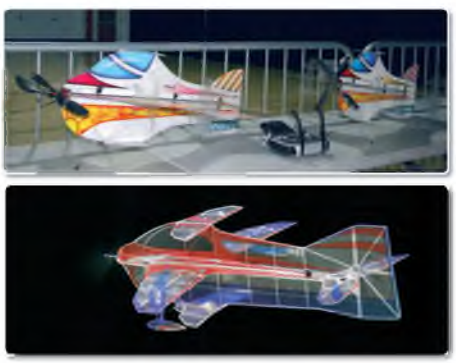
Freestyle – 1st Liam Clayton, 2nd Connor Stephenson, 3rd Rory Tooley

Aeromusical – 1st Derk Van der Vecht, 2nd Connor Stephenson, 3rd Bert Van der Vecht

F3P – C 1st Luke Oliver, 2nd Dave Bedford, 3rd Alex Moseley-Ames

F3P – B 1st John Gaynor, 2nd Mark Taylor, 3rd Max Stringer

F3P – A 1st Derk Van Der Vecht, 2nd Connor Stephenson and 3rd Liam Clayton



The Light Fantastic

Following an all too brief transfer to RC Model World, after compiling his column for Q&EFI magazine for many years, Chris Golds has decided to call it a day. He starts his final gallery of readers' pictures with one last tale from the cockpit of his R.A.F. Hunter

Our departing columnist, Chris Golds with his latest build of a favourite aeroplane

Mike Titterton's Ready-To-Fly Venom

Mike Sparrow's delightful T-P flying machine

Richard Jones' O.D. colourful EDF Draken

Francis Galea in a Tiggie at Duxford 2015

Downtown

I was driving back from bell-ringing in December 2015 and the little country road crossed over and above the A39 to Bideford – a four lane dual carriageway full of traffic. For a short moment I looked down upon a double line of red tail-lights and a double line of white headlights and suddenly – BLING!

Late in 1963 our Hunter squadron (No. 43(F) The Fighting Cocks) had continued its daytime low-level armed cover sorties – to try and protect our ground troops in Aden – into the night. The Yemeni insurrectionists were getting bolder and causing increasing casualties to our brave guys on the ground. The sorties had to be flown by singleton aircraft, armed only with our redoubtable 30 mm Aden cannons.

The name was nothing to do with the place but with Enfield back in the UK. The ground troop commander would have coloured two-inch mortar rounds fired into where he thought the enemy attack was coming from and his FAC (forward air controller – usually an infantry officer but occasionally an Air Force Hunter pilot with an FAC 'ticket'). Our job was then to shallow-dive (between 20 degrees and 30 degrees) onto the (usually) purple smoke from the mortar round and spray the area with some short bursts of 30 mm. It mattered not that we could not see the enemy, but the army were very pleased to see us raising merry hell in the enemy's direction.

We had about five to six two-second bursts before our cannons were empty, then we would pull up and away, allowing another Hunter to be brought into the attack. We were usually only fifty miles away from Khormaksar (our airfield) and recovery was relatively simple. Except on this particular night, when low cloud forced me to seek help from the approach controller in order to find the easterly runway as I approached with my wheels and flaps down in order to land, re-arm and scramble once more back into the punch-up.

Tom Brough's rendition of a Keil Kraft Bandit

With distances passed to me from the GCA (ground controlled approach) man I eventually broke cloud at about 600 feet height, to be astonished to see in front of me – at only about one mile distance – a long string of red lights to the left of my path and white lights to the right! I rapidly sussed what was going on and that I had nearly touched down on the dual carriage way through Maala, a local accommodation area. I added just enough power to level and stretch my approach to join the easterly runway at Khormaksar, now just one mile ahead, landed and taxied rapidly back to our squadron dispersal to get re-armed but not refuelled as I had plenty of AVTAG for another short sortie.

I cursed my stupidity and was grateful not to have landed 'down town'! On my next sortie, some twenty minutes later, the cloud had disappeared. Such is life!

And So To Work...

From Michael Titterton of Prestbury in Cheshire we see his Ready-2-Fly Venom in Swiss air force colours. The 1.5 metre foam model weighs 2.5 kg for its 90 mm EDF unit running from 6S 4500 LiPo power and it is now in its third season. Well done Mike and thank you for your comments. (Pic 1)

Mike Sparrow showed us his 'Teetering-Plummet' flying machine in action in our last Light Fantastic so I thought it wise to show the man and his model in close-up. The very

Graham Dorschell's latest, a T-Bird with a prop

The T-Bird in close-up

The Replica Bristol Scout – with Lewis gun. Photo by Bob Partington

Bob Partington's Hawker Fury in-build

Ken Rolph's Hunter DFGA Mk9

The true decoration of 'my own' Hunter

funny account about the real (I use that term with great disbelief) TP machine's first flight was written I am sure by Mike under the pseudonym of Q.F.I. What more can I say? Thanks Mike. (Pic 2)

Richard Jones has appeared in Light Fantastic many times before, mostly with unusual EDF models. This time he shows us his O.D. Saab Draken double-delta jet fighter of the 1960s – and very attractive it is. I distinctly remember at R.A.F. Chivenor – of blessed name – when I was doing the commentator bit at a 1980s Chivenor Air Day, that a Draken arrived on the Friday afternoon (like all the other display aircraft) and THUMPED down on the runway SO HARD that I swear that I felt its arrival in my commentator's box on the top of Air Traffic's roof! I suppose the pilot was wary of our short (one mile long!) main runway instead of five miles of Swedish back road and thus dropped it as slow as possible. Well he certainly did drop in! Thanks, Richard. What is next from your drawing board? (Pic 3)

Francis Galea is another long-time Light Fantastic contributor and hales from Malta, the GC Island. But here we see him in his element in the front seat of a Tiger Moth at Duxford in 2015. Our thanks Francis, and to Eileen as well. I bet you enjoyed that trip: I can hear the idle note of a Tiggie inside my head while I am writing this column at 06.15 hours on a very cold February morning – brrp, brrp, brrp, brrp! (Pic 4)

Yet another of our regular and long-time contributors is Tom Brough from 'up north' and he shows us his delightful O.D. 'E' version of a Keil Kraft Bandit, a most handsome free-flight IC model from our childhood times. Thanks Tom, regards to Jean and the best of luck when the weather allows a first flight of the Bandit. (Pic 5)

And yet one more regular Light Fantastic'er, Graham Dorschell is once more back in Thailand, where I think he has a second home. He shows us his latest, which is a T-33 but with a prop on the front. And only a bang-seat in the front, how strange! Thanks Graham, and our regards to Thailand! (Pics 6 & 7)

This seems to be an 'old buddies month' as next we see Bob Partington (the Boss of the Colerne E-Fly meetings) and a real aeroplane, which he has been chasing for some time now. We see a replica Bristol Scout in French markings and showing one of the first methods of firing a machine-gun forwards without cutting off your prop, using an angled-off Lewis mounted on the right side of the cockpit. Must have been very difficult to chase, catch, angle-off, shoot and bring down anything this way in 1915! (Pic 8)

Bob's other picture is of his build of my Hawker Fury biplane plan (MW3296 of October/November 2007), which he says, "Takes me back to Keil Kraft days – just

Sean in NZ with his Purple Dart

Anthony Bennett's Trent Meteor

The Meteor's forward fuselage in Depron-build

The model comes to life

My mystery aircraft – the P1067 Hunter Prototype

The bottom of WB 188, with photo U/C

much more of it!" Thanks Bob and good luck with flying the model. Mine was an absolute sweetheart. And talking of sweethearts, our regards to Christine. (Pic 9)

Ken Rolph sends us photos of his model Hunter, presumably built from my plan (MW 3241 of Nov 2006) for a Schubeler 90 mm EDF unit, but flown at some time during its life using a Wren 54 gas turbine for its power source. The model is still in its colour scheme of my real Hunter XE546 from 1961 to 1964. Many people have asked, "Why the white wingtips?" (Pics 10 & 11) They were common on Hunters to accurately show the span on gun-sight film, which was in negative form and thus they needed to be white to show up black in order to assess the film. Or have I made that explanation just too complicated? Thanks, Ken. When will you fly her?

Just one more 'oldie', Bill Macleod (ex CAA chief examiner and model autogyro nut-case) is on holiday down in New Zealand. He sends us a photo of his friend Sean's new O.D. 'Purple Dart' built in one evening after too many beers! Nevertheless it flew straight as a dart (of course!) and Sean is very pleased with the prop-driven model. Thanks, Bill – love to Moi. (Pic 12)

Anthony Bennett wrote and illustrated a couple of articles about getting started in Depron foam so I blame him for my current modelling dramas. He shows us his in-build Gloster Meteor, which was produced for twin Trent turbo-props – just to be different. Thanks Anthony, we look forward to seeing her in the air with twin electric props. (Pics 13-15)

So, what have I achieved of late?

Well, the mystery model is now completed and awaiting good flying weather. It is, of course, a Hunter and of that delightful breed, it is the P1067 Hunter prototype from 1951. Almost entirely from Depron, although I simply had to include some of my favourite material – balsa! She sports a photo undercarriage and when these parts are removed she weighs 6 pounds 15 ounces, including 6S 3700 LiPo cells. The power is 158 watts per pound and the wing loading is 15.85 ounces per square foot – WOW! (Pics 16 & 17)

So Now To The Sad Bit

I have decided to finish Light Fantastic with this column – Number 214. I have been drivelling on since I began in Electric Flight International in April 1998 and continued when EFI became QEFI. I have made a vast number of model acquaintances and a large number of friends, especially the Editors for whom I have worked. With the demise of Q&EFI, arguably the finest electric model flying magazine in the WORLD, I think the time has come for me to step off the stage.

I wish you all very happy and safe flying, either large-size or small-size, and I hope you have as much fun as I have had since the distant days of Skyleada, Veron Frog and of course Keil Kraft! There are literally dozens of my designs in the Traplet Plans range, so we can easily keep in touch through email and this I would enjoy. Good-bye my friends and remember – FLY SAFE. ***RCMW***

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Email: chrisgolds@loxhore.org.uk

RealFlight Drone Simulator

As with all types of R/C model it's always best to try new things within the virtual world of a simulator before doing it for real at the flying site. RealFlight have taken everything that makes their fixed-wing and heli simulator great and turned it into a smaller, drone-focused package. Jordan Harding takes it for a spin

Box contents include a neat R/C style controller, a cable for connecting other R/C systems and the software in a dedicated CD case

Practicing on the RealFlight simulator has boosted Jordan's confidence when flying drones for real

One of the more 'flying site-esque' environments

Skies are very photo-realistic in Drone Simulator

Night flying looks great!

Introduction

I would say I am very much a beginner when it comes to flying model aircraft, having only taken a few brief fixed-wing lessons in the summer using the buddy box method. While eventually I would like to be able to fly all sorts of R/C models, FPV mini quad racing has really grabbed my attention and so learning to fly multirotor drones is at the top of my list. While I have mainly been practising on a small indoor quad, I was excited to be able to gently introduce myself into the world of larger drone flying and aerial photography using this simulator. The RealFlight Drone simulator allowed me to practice as much as I wanted without the weather stopping me, as well as avoiding taking risks and damaging a real model.

In The Box

All the kit you need comes in one box and includes the software disc, an Interlink Elite Futaba controller and cables enabling you to use your own controller if preferred. It's a simple case of installing the RealFlight software, plugging in your controller via USB and away you go. It takes just a few minutes to set up (depending on your computer's specs). One thing to be aware of is that the program and its installer come on a disc, so if you do not have an optical drive then you may have to install the program on another computer and copy the files across.

The supplied controller feels well made and features everything you would expect from a normal handset, including mode switches. There are also a few extra controls, such as rewind and reset buttons, removing the hassle of switching between controller, keyboard and mouse.

Trying to line up the perfect castle shot

The detail of the models and their attachments is superb

Flying a tricopter through a tranquil Japanese garden

There are multiple on-screen overlays to help analyse your flying

Models

The Drone Simulator features the three main branches of the drone hobby: Aerial Photography, 3D and FPV. For a beginner it's great to be able explore all of these types of flying in one place. The scope of what you can do is matched by the variety of aircraft you are able to fly using this simulator.

There is a decent selection of models to choose from (14 in total) including lookalikes of the DJI Phantom, Hubsan X4 Pro etc. While some of the models do feature an 'FPV' camera angle, there's not really much in the way of the standard 250 mini quad mainly used in FPV racing and there is really only one 'proper' 3D model.

Having said that, there is a nice variety of drones equipped for aerial photography. When in the actual camera view you can change the angle of the gimbal to practise framing up your shots. This is a great little feature and really helps improve your awareness of your model in relation to the camera.

Each drone in this simulator handles differently, so once you've mastered flying the slower steadier models you can easily move out of your comfort zone and start practising on the livelier models, which ultimately can help you become a better pilot.

While there's always a slight difference between a model in a simulator and one in real life, the RealFlight team have managed to create a fairly realistic recreation of drone flying, especially when you apply a small amount of wind.

Environments

There are 20 different environments to choose from, such as a junkyard or through a castle's grounds. Each environment gives a vast amount of space in which to fly with a few of the usual obstacles in place: trees, buildings, stationary vehicles, spectator stand etc. There is also the option to reduce the amount of obstacles if you'd rather have a more 'local flying site' environment.

Changeable wind speed and sun azimuth can also be altered. This is a big help, especially for UK pilots as windy conditions are unfortunately something we have to deal with all year round, especially at this time of the year. There is also a 'walk mode', which unlocks the camera and allows you to walk around the environment if you so wish.

Challenges

The Drone Simulator comes with two challenges: Scavenger Hunt and Quadcopter Trials.

Scavenger Hunt is a great way to build up basic FPV skills. The premise of the challenge is to 'photograph' certain objects in the environment (such as hay bales, tractors etc.) in FPV mode. This is done using a circular overlay to help you line up the shot; the camera will automatically take a photo when you're near enough and you will be awarded a score based on how well composed the shot is.

Quadcopter Trials has you flying through a series of ever more challenging groups of gates, obstacles and landing pads. This challenge mode is very video game-like but definitely helps with fine correction skills and orientation if you are flying line of sight.

Rewind

The included R/C style controller has a handy rewind function very similar to most modern car racing video games. If you make a mistake, rather than starting from the very beginning you can simply press rewind and try again. It's a very handy feature for when you're trying to line up the perfect aerial shot and accidentally hit an obstacle.

It's worth trying not to use this function in normal flight though. Obviously, there's no rewind button out at the flying field and you don't want to be desperately trying to hit it when it all goes wrong because you've become used to doing so on the simulator!

Physics

The physics model in this game uses Realflight's 'RealPhysics' technology. This means that crashes are very realistic and are based on how the model hits objects in the environment. You can potentially get away with knocking into an object as the damage sustained is proportionate to the strength of the impact, just like in real life.

The RealPhysics technology also means that collision detection is completely accurate and based on hundreds of sensor points on each model. This again makes any impact much more realistic.

Final Thoughts

All in all the RealFlight Drone Simulator is a fun, realistic way to introduce yourself to the world of multirotor flight, as well as for seasoned pilots wanting to practise those risky manoeuvres before trying it for real.

While the FPV and 3D side of things could be improved, this simulator still covers all the fundamental aspects of our hobby and I can only see it getting better and more in-depth in the next iteration.

The Drone Simulator has really boosted my confidence when flying for real; because I've already practised certain manoeuvres on the sim I no longer worry about crashing the model and can focus on the actual stick movements.

Obviously this software is predominantly aimed at people who would like to practice flying multirotors, but if you fancied trying your hand at helicopter and fixed wing flying there is an option to upgrade to the full RealFlight 7.5. Upgrading to this version is a fraction of the price that you would pay for the full package and in my eyes it's well worth it if you would really like to explore model flying in its entirety.

RCMW

Among the camera options is chase mode

Ramping up the wind speed

Made a mistake? Simply press rewind!

Scavenger Hunt is a lot of fun!

MODEL WORLD

PRODUCT INFORMATION

NAME: RealFlight Drone Flight Simulator
MANUFACTURER: RealFlight
DISTRIBUTOR: Hobbico in the UK
WEBSITE: www.RealFlight.com/drone
PRICE: £104.99 SRP

SYSTEM REQUIREMENTS

MINIMUM:
Windows Vista/7/10
(Administrator access to Windows required)
Intel® Pentium® 1.0 GHz or equivalent
512 MB RAM
3 GB Hard Drive Space
DVD Drive
3D Accelerated Video with:
- 32 MB Dedicated Video Memory
- Full DirectX 9 compliant
(Shader Model 2.0 or better)

RECOMMENDED:
Dual Core 2.4 GHz CPU
2 GB RAM
3D Accelerated Video with:
- 512 MB dedicated video memory
- Pixel Shader 3.0 support

INTERLINK® ELITE CONTROLLER:
USB Port
Compatible FM or FM-selectable controller
(if using the interface mode)

Note: The connectors on the InterLink Elite cord and included adapters make the InterLink Elite compatible with the trainer jacks on most Futaba, JR, and Spektrum systems.

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1:4 Scale
MW3005 Fokker Dr.I
MW3125 Fokker D.VIII

1:6 Scale
MW3225 Albatros C.III
MW2218 Fokker E.III
MW3599 Fokker D.VIII
MW2187 Fokker Dr.I
MW2044 Halberstadt D.II
MW3068 Pfalz A1
MW3457 Pfalz D.XII
MW3369 Rumpler C.IV

VICKERS MACHINE GUN (FLUTED BARREL)

The Vickers machine gun became the standard armament of British and French WWI military aircraft. It was heavier than the Lewis Gun, but could be synchronised to fire through the propeller arc. Used on aircraft the water cooling system was unnecessary.

1:4 Scale
MW3467 RAF SE.5a
MW3290 RAF SE.5a
MW2011 Sopwith Pup

1:5 Scale
MW2248 Sopwith 1 1/2 Strutter
MW2042 Sopwith Camel

1:6 Scale
MW3455 Bristol Bulldog
MW2020 Bristol Scout
MW3442 RAF SE.5a
MW2036 Sopwith Camel

VICKERS MACHINE GUN (JACKETED BARREL)

The Vickers machine gun became the standard armament of British and French WWI military aircraft. It was heavier than the Lewis Gun, but could be synchronised to fire through the propeller arc. Used on aircraft the water cooling system was unnecessary. but the jacket was retained, emptied of water and had gills cut in it to allow cooling air to be forced through it.

LEWIS MACHINE GUN

The famous Lewis Gun was the first machine gun to be fired from an aeroplane. Easily recognised by its distinctive pan magazine, it was reliable and lightweight, and was fitted to many British and French fighter aircraft. It could not be synchronised to fire forwards through the propeller arc, so was often mounted on top of the upper wing to fire over it, or was on a swivel mount and fired by a gunner.

1:4 Scale
MW3467 RAF SE.5a
MW3290 RAF SE.5a

1:5 Scale
MW2791 Nieuport 12
MW2248 Sopwith 1 1/2 Strutter

1:6 Scale
MW3315 Airco DH-2
MW2907 BE2C
MW2020 Bristol Scout
MW3442 RAF SE.5a

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Volume 3.
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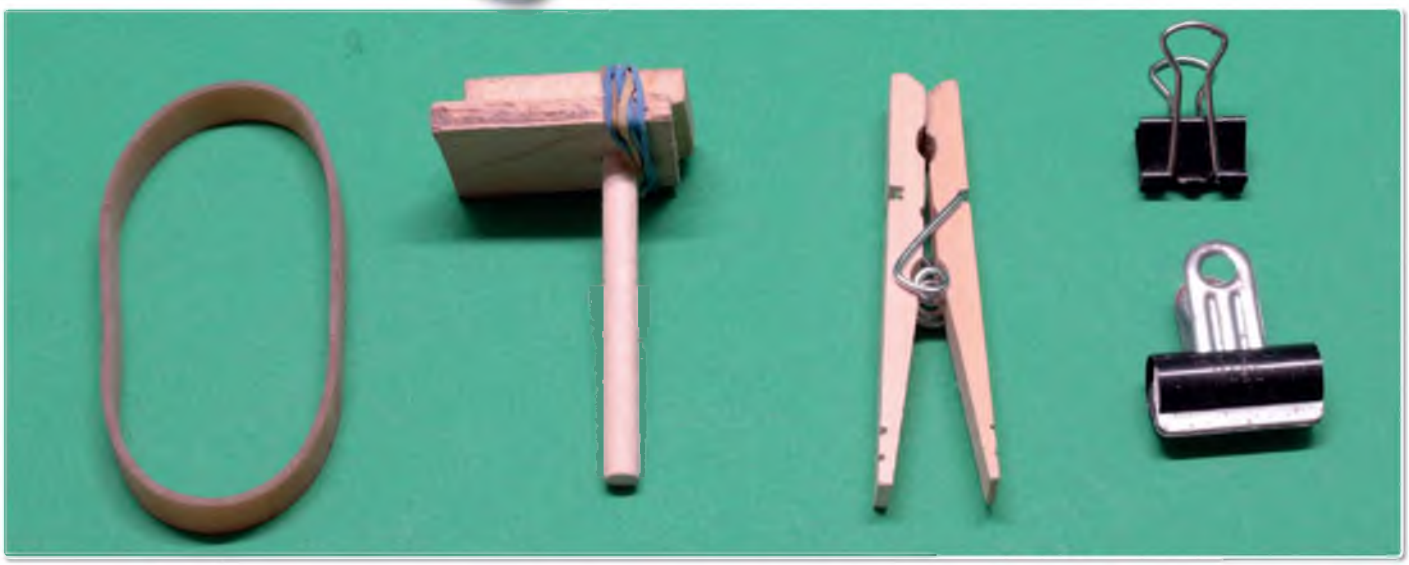
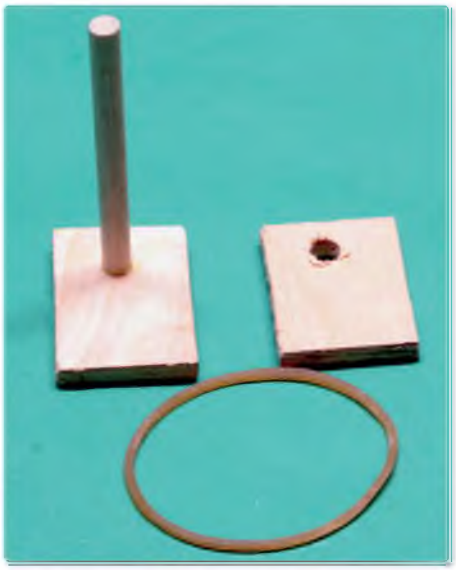
Clamp It!

Bill Bowne gets to grips with more workshop workarounds

Mechanical clamps (from left): 'C' , bar, and pistol grip. Bar clamps are really 'C' clamps with a variable-depth throat



Elastic clamps (from left): Elastic band (surprise!), homemade thumb clamp, spring clothes peg and two binder clamps



Homemade thumb clamps are a good way to use scrap ply and dowelling. Being openable with one hand is an added bonus

Spring clothes pegs also make great impromptu grips for items to be soldered or painted, as in these wheel hubs

Reduce clamps denting your work by adding a pair of lolly sticks. (Yes, I know it's a screwdriver but it still shows my point!)

Mix and match your clamps to suit the job. The Waco's wing TE is too thick at the root for clothes pegs so I used 'C' clamps (plus dent-reducing dessert sticks) in the very centre. Spring clothes pegs worked fine on the thinner parts of the TE

Two rubber bands and a pair of lolly sticks (or pencils, dowels, etc) make useful clamps when the opposite sides are parallel

Pistol grip clamps don't allow quite as much fine-tuning as 'C' or bar clamps but they are faster to attach. On the other hand, they're usually lighter than the same throat depth 'C' or bar clamps

No, this isn't about the Clampetts from 'The Beverly Hillbillies'! Instead we're going to talk about clamping things together whilst the glue dries.

Sometimes we need to hold parts together but don't want to put pins through them. It may be that the parts are too hard for our trusty 'T' pins. Or the parts are important structural members, like spars, and we definitely don't want to go putting holes in spars... Then again it may be another reason why pins are out of the question. That's when we reach for our supply of clamps.

There are commercially made clamps, clamps made from clothes pegs, binder (bulldog) clamps, rubber bands, clamps made from pencils and so forth. I'm going to divide clamps into two groups - Mechanical and Elastic/Spring (we'll stick with calling the latter 'Elastic' for short). Mechanical clamps get their action via either a screw or hand pressure, whilst Elastic clamps get their pressure from a spring or stretched rubber band.

Each type has its benefits. Elastic clamps are usually cheaper (especially good if you're a poor mountaineer who barely kept his family fed) but controlling the amount of pressure they exert is tricky. Mechanical clamps are easier to fine-tune but they are usually heavier and more expensive.

Probably the simplest and most common elastic clamp is the ordinary clothes peg. I recommend the wooden ones, not plastic, for a few reasons. For one, clothes pegs are great for holding work being soldered. Wooden clothes pegs may char and smoke if they get too hot but they'll still hold. On the other hand plastic clothes pegs can melt, dropping the work being soldered onto the bench (or your foot) – not good. Wooden ones also seem to be stronger, especially when over-stretched around a big part. Finally, some solvents and chemicals can attack plastic clothes pegs, literally making them crumble.

All of the clothes pegs in this article are from my personal collection. (Yes, MINE, not my wife's! I don't recommend swiping your spouse's clothes pegs. If she finds glue on them she may get very irate and demand recompense. It's a lot easier to buy your own bag of clothes pegs than it is to swipe hers and then have to take her out to dinner to apologise!)

Clothes pegs are great in their native form. But you can make some simple modifications to expand their usefulness. I'd wager that modified clothes pegs are the most common building hints you'll see in magazine columns.

Another elastic clamp is the common bulldog or binder clamp. These are available in the office supply section of almost any department store or from (surprise!) an office supply store. One problem with bulldog clamps is that they're usually pretty aggressive. They'll easily make excessive dents in soft wood. On the other hand binder clips are cheap and work great at holding sheeting to spars, and are especially useful in tight quarters (especially if you fold the wire clips back).

My favourite type of bulldog clamp is the bottom variety. They aren't as aggressive and the jaws are larger so they don't do as much damage. Plus they are easier to squeeze. One problem is that they cost more

so they're getting harder and harder to find. The other problem is that they're also good for closing potato crisp and cookie bags, so my collection somehow keeps shrinking, whilst the ones in the kitchen junk drawer keep growing. Hmmm…

Another form of spring clamp is one made with rubber bands. I've made up a dozen or so thumb clamps from scrap ply and dowelling (I call 'em 'thumb clamps' because I use my thumb to press down on the dowel end to open them up). The dowelling is glued into one clamp plate, whilst the other plate is free to slide along the dowel. One (or more) elastic bands provide closing pressure.

By themselves rubber bands can work as decent clamps, although it can be a royal pain when a rubber band gets glued to the work piece! A better way to use rubber bands is with a pair of lolly sticks or dowels. With two rubber bands and two dowels you can make a 'Square' clamp that will apply equal pressure along the two dowels.

Mechanical clamps have a great advantage over elastic clamps in that you can fine-tune the pressure they exert. The most common are 'C' (so-named because of their shape) and bar types (which strikes me as a 'C' with a variable-depth throat), and pistol grip clamps. They're a bit pricier than elastic clamps so most of us will have a mix of these mechanical and elastic clamps in our workbench drawers.

Another benefit of mechanical clamps is that they're available in a wide variety of sizes. Large spring clamps are usually too strong for modelling purposes but big mechanical clamps can be adjusted to provide the gentlest pressure needed.

Avoid having a 'Lucille Ball' moment by keeping your clamp supply within arms reach. My clamps are kept in this portable plastic bin, which stays on the workbench top when I'm building

One way to reduce damage to soft wood by spring or mechanical clamps is by spreading out the pressure force. I use lolly sticks for this. If you're worried about the sticks being glued to the work place a layer of plastic sandwich wrap between the work and the stick.

Just make sure to consider the weight of the clamps, as they can bend and warp your work. Use the right clamp for the job!

Okay, time to turn off those TV repeats and get back to the workshop! ***RCMW***

Whichever clamp you use please make sure it's the right size for the job!

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LMMAS_RCMWJAN16

XK 5.8 GHz FPV Set

Upgrading the XK Detect 380-C camera drone featured in the March issue to FPV is a doddle using this simple to use 4.3" screen and 5.8 GHz video transmitter set

The FPV screen fits securely around the aerial of the XK transmitter

We concluded the Detect 380-C review in the March issue wishing for a First Person View from the camera. Apart from that we were very happy with the performance of this easy to use aerial camera platform. Our wish was soon realised when CML, XK's UK distributor, sent over a small box containing a bolt-on 4.3" display unit to attach to the R/C transmitter and a compact video transmitter for the drone, complete with an omni-directional mushroom antenna mounted on the end of a short stalk.

The package also comes with a USB lead with which to charge the integral 440 mAh LiPo battery. Charging time is stated as 80 minutes, giving a working time of more than an hour. The pack is supplied partially charged so the first charge was a lot shorter than that but it still gave us plenty of time to fix the screen to the drone's transmitter and also to find a home for the video transmitter on the side of the model.

Display Mount

XK transmitters have a distinctive pyramid shaped aerial and the FPV screen's mount is designed to clamp around the base. The mount is supplied in two parts and consists of an inverted V-shaped bracket that plugs into a pair of holes in the back of the transmitter and a short front piece into which the screen is clipped in place. The bracket is held together with a pair of thumbscrews so it can be easily taken apart if required.

The base of the screen is moulded with a round clip that needs to be pushed firmly onto a matching circular rod inside the front piece of the bracket. This effectively forms a hinge with close to 90 degrees of movement, allowing the user to rotate the screen for the best view and to minimise reflections. A clip on sunshade is also provided to shield the screen as much as possible.

On the back of the display unit is a recessed bank of three tiny DIP switches, which can be used to select one of eight channels. The display was preset to Channel 1 (or maybe it was Channel 8?).

Fitting the screen is completed by screwing the short aerial into place. The base of the aerial is fitted with a knuckle, allowing it to be angled for best reception.

Launch Module

The video transmitter, also known as a launch module, is supplied in one-piece, with the mushroom aerial factory fitted on a short stalk. The unit needs to be attached to the drone using a thick pad of double-sided foam, but before you remove the backing paper some thought needs to be given to the best place to fix it so that the aerial's dome is protected. The somewhat sparse instruction sheet does not offer any suggestions, although it is pretty obvious that pointing the mushroom upwards into the propeller arcs is not a good idea! So that leaves either a downward or horizontal position; we settled for the latter, with the mushroom pointing out from the rear of the Detect's main body. Before attaching the foam pad we gave the body a good wipe over with a cleaning swab to maximise its adhesion.

The launch module is fitted with two leads. The one that looks like a servo lead is plugged into a micro USB adapter lead supplied with the FPV set, and the USB connector is in turn plugged into the side of the Detect's action camera to pick up the live video feed being produced by the camera. The adapter lead is quite long so some tie-wraps are provided to anchor it loosely to the camera gimbal mounted underneath the airframe.

The other lead is a power lead and it comes pre-fitted with a red JST plug. You may recall from the original review of the Detect drone that an extra Y-lead was supplied, and this is where it comes into use. It simply breaks into the cable used to power the gimbal mount and provides a spur to power up the launch module. Easy!

As with the display unit the launch module also has a bank of three DIP switches. Both switch banks need to be set to the same settings to make sure both devices use the same channel. The display was preset to Channel 1 – or maybe it was Channel 8? (Any idea where this is leading…?)

With the FPV display attached to the R/C transmitter and the launch module safely taped to the side of the drone we waited patiently for the next calm(ish) day to test the system.

The inverted V-shaped bracket fits into a pair of holes in the back of the transmitter

A pair of thumbscrews clamp the front and rear parts of the mount together

There's no dedicated position to mount the Launch Module on the X-380 so we taped it on horizontally, with the mushroom aerial pointing out the back

The AV lead plugs into the USB socket on the side of the camera. Be careful not to switch the camera off when plugging the lead in!

Display rear panel showing the DIP switches that can be used to select any one of eight channels. Make sure that the switch settings match those on the front of the Launch Module

The screen provides a clear 'camera-eye' view. Ignore the moiré pattern on the screen as this was caused by camera used to take this picture

A USB lead is provided to charge the display

Plug & Play?

Having got so used to the latest gadgets just working when we have tested them, we were confident that the same would apply to the XK FPV set. So we were a bit disappointed, upon powering everything up, to see the screen showing a 'No Signal' warning. A quick check of the wiring showed that all the connections were correctly made and a glance at the channel selector switch banks on both the display unit and the launch module showed that they looked the same. With time ticking on and a desire to fly a number of other R/C aircraft and drones (this being a weekend flying session) the Detect was bundled back into the car for looking at later.

Back at home the Detect was powered up once again but there was still no sign of a picture on the screen. As a last resort we decided to double check the factory setting of the DIP switches and – bingo! – we saw that they were reversed. One unit was on Channel 1 while the other was set to Channel 8! Our frustration at not spotting such a simple error was nullified somewhat by the clear picture of the patio that now beamed back at us after reversing the set of switches on the back of the display unit.

Second Time Lucky

The following weekend saw us back at the flying field. The Detect was powered up and this time the FPV set provided a clear view of the concrete road that the drone was sitting on. So the drone was taken off and steered over to a model aeroplane that we had left sitting in the middle of the flying field for 'target practice'. Using the X-380's 'Fly Around Point' function were were able to fly in circles above the plane whilst using the FPV screen to adjust the camera's view, a feature that we will be exploiting to take some interesting pictures of future review models.

We also used the FPV screen to track the drone alongside a line of trees bordering our flying field, which would look great in a video segment, and then powered the Detect up to higher altitude to line the camera up on our most prominent local feature, the Malvern Hills. This time, rather than guessing the correct camera angles and cropping out any mistakes in post processing, we were able to use the gimbals to target the camera at the exact view that we wanted. Marvellous!

What followed was not quite so marvellous, as when we returned home and hooked the camera up to the laptop we discovered that camera had been switched off after just a few frames, missing all those stylish sweeps around the model aeroplane and our careful alignment of pictures of the hills.

What we think happened here is that when inserting the AV Out lead into the USB connector on the side of the camera we accidentally pressed the power button when gripping the camera case. This is not a fault of XK's excellent FPV set, which provided a crystal clear view throughout the test flight, but making sure that the camera is still switched on just prior to take-off is something we will be very careful to check before lifting off for another photography or video session.

Final Thoughts

Although the FPV set provided a clear view of what the camera was seeing, things were a little dark and this was especially noticeable when tracking alongside the trees. A small adjustment to the camera settings should sort this out though and we look forward to our next trip out with the Detect X-380 – especially now that we are getting such a clear bird's eye view! ***RCMW***

Other Uses?

Since the FPV system operates independently of the R/C system it should also be possible to fit it on alternative models that can be fitted with an action camera, be they drones, planes, helicopters or even R/C cars!

All that would be required is to make up a suitable bracket to hold the display screen onto your transmitter, maybe by clamping it to the handle? The launch module has an operating voltage of between 7.4 – 12.6 volts so it could either be patched into the model's existing power supply or a separate battery could be fitted.

And since the AV lead terminates with a servo lead socket all you need is a spare extension lead with an appropriate AV Out connector soldered on the other end to connect up the camera.

RC MODEL WORLD

PRODUCT INFORMATION

NAME:	XK380 5.8 GHz 8 CH FPV Set
MANUFACTURER:	XK Innovations
DISTRIBUTOR:	CML Distribution
WEBSITE:	www.cmldistribution.co.uk
PRICE:	£129.99
PARTS SUPPLIED:	4.3" LCD screen with 5.8 GHz receiver, Launch Module, USB charge lead, Tx mounting bracket, AV Out lead
PARTS REQUIRED:	XK380 Power Adaptor Cable (supplied with drone or available as spare part)

The Sport Channel

The Keil Kraft Consort 'mystery' solved and we take a look at a rare breed of Shark!

"For every mystery, there is someone, somewhere who knows the truth..." ('Unsolved Mysteries' TV series)

We're pleased to declare the case of the mysterious Keil Kraft 'Consort' closed. The KK kit that was never kitted was actually the work of 'Mr. Scale' himself, the great Dave Platt, another SC modelling hero. Work on the Consort stopped due to Dave's involvement with the 'Battle of Britain' movie!

This Month's Wise Words

Our item on the curious case of the Keil Kraft 'Consort', the sport aerobatic R/C design that was briefly advertised in the late 1960s but never apparently kitted, received a lot of interest and several theories were offered as to why it should have fallen by the wayside.

Gloucestershire's own Sid King suggested that the Consort may have been one of KK's projects in development at the time of KK founder Eddie Keil's tragic death in 1968. It's a well reasoned theory, as who knows what he may have been planning for KK's future.

Enlightenment though came from an unexpected source. Levent Suberk from Bursa in Turkey (only our second-ever correspondent from that country, I believe) contacted us with the definite explanation. Levent writes: *"I've been an aeromodeller since the late 60s and I like Keil Kraft models. The KK Consort was designed by Dave Platt! I received following mail from Dave about Keil Kraft Consort: 'I regret to say I never did keep a plan of the Consort. In fact, I've often thought I'd like to make one myself. I suppose if someone was determined enough it would be easy to recreate the design from the existing photo. It was designed in 1965, the only prototype had an OS .60 and an early propo set (Bonner Digimite, which we quickly rechristened 'Dodgymite'!) but was never released by Keil because I was fully involved with the 'Battle of Britain' movie at the time."*

Well, you can't get more compelling evidence than that! Thanks, Levent, for solving that mystery for us and our admiration for having such a distinguished contact as Dave Platt!

Dave is another modelling hero whose work has been influential to many a modelling career. With many kit designs and published plans to his credit, Dave went on to become a groundbreaking R/C scale pioneer. In the late 1960s/early 1970's, he championed the use of weathering in the finishing of flying scale models (a technique which had mainly been confined to the realm of plastic modelling at the time) and took the genre to new levels of realism. At a time when many scale builders aimed to produce glossy 'straight from the factory' subjects, Dave astutely pointed out that such aircraft wouldn't appear with squadron markings and victory tallies!

Dave moved to the USA some time ago where he still creates scale masterpieces (check out his models online), but also revisits 'traditional' modelling with some spectacular projects. It's fitting that Dave should make an appearance here, following the item on the Larne club's fleet of Platt-designed 'Half Tones' – there'll be more on them shortly too.

Incidentally, the mention of the 'Battle of Britain' movie (for which Dave designed all the R/C special effects models) reminded me – the first time I ever saw it was at the cinema at RAF Hullavington during the weekend of the 1972 Nationals. To see this landmark war film surrounded by hundreds of other aeromodellers, all in their element, was quite an experience! Was anyone reading this also there?

Eric Cluton's 'Sharkface' has made numerous appearances here over the years. Probably the most well known micro R/C model, it has a virtual fan club throughout the world. Raymond Lefrancois's incredible trimotor version flies well with three Cox TD .010s!

Rare Breed of Shark...

I knew what would happen as soon as we'd included the shot of Colin Hutchinson's small model fleet last time out. Whenever any of the designs we featured put in an appearance, the fan mail comes in.

The now 50+ year old 'Sharkface' single channel favourite has a special place in the column's readers' affections and this time it was our US correspondent Raymond Lefrancois who mailed in to tell us about his very individual variant.

Raymond explains: *"By way of preface, let me remind you of some major historical events here in hot and humid North Carolina that occurred as a direct result of devoting my legendary modelling skills and dedication to the preservation of the best of British Small Models.*

It all began with Eric Clutton's 1965 Sharkface that I built pretty much as he would have recognized it with elevator and rudder guidance and a built-up wing. This model was campaigned during the early years of the Carolina 1/2A Crew (which had received worldwide acclaim via RC Groups – yes it IS hard to be humble...).

Then my normal modeller instincts kicked in and I decided that perhaps Mr. Clutton's great design deserved to be brought up to date and 'kept alive'. Thus, 'Sheetface' was conceived and executed.

Still powered by various Cox Reedies, the only major differences were a trim and streamlined fuselage and an all-sheet wing. (This model still lives but seldom sees the sky because I avoid reed valve engines and love my TD .010 and .020s!)

The latest evolution of my Sharkface saga took place maybe four or five years ago with the emergence of . . . wait for it . . . Tresface. Yes, this is powered by three (3) TD .010s. Previous flights have been limited in number to three.

Each of these successful (what else?) excursions into the firmament was preceded by much engine testing to ensure that the middle engine was the last to run out of fuel. Well, one weekend, the pre-flight machinations were just like all the others – except that the weather conditions were hot and windy (did I mention HOT?).

Anyway, after futzing around with the improperly stored engines gummed up with nasty old castor oil, I bravely decided to boldly go where few of my club mates had dared go that day – in the air (because of the wind). Three little screaming engines 'singing' to me, my faithful hand-launcher's jaw firmly set, I give the fateful order, "Let 'er rip!"

Every sense of my finely-tuned, muscular body focused on the quickly disappearing model, I am yet aware that every pair of eyes is locked on me and Tresface. My agile fingers flash from sticks to trims and back but a few times to perfect the already fine trim of the model (ah, the never-ending quest for perfection). This time the 'bird' is performing even better than on previous flights. This time I boldly choose to stretch the flight envelope and drop the nose slightly, pull back – and a nice, large, round loop ensues. A few more eights and the right engine quits. No sweat.

Previous flights have proven that as long as the middle engine is running she acts like she never misses the other one (yet another example of outstanding engineering design, I humbly admit).

Alas, even in spite of my previous careful testing the middle engine quits and my model shows the tendency to spiral! Quick as a frightened bunny, I switch to high rates and counteract the dread screw-shaped manoeuvre and bring Tresface to rest in the winter wheat that borders our runway.

Modesty prevents me from fully recounting the chorus of cheers and 'hurrahs' that accompany my triumphal 'parade' back to the pits. Suffice it to say that an average person would have blushed. Thus endeth the most recent Sharkface saga here in beautiful downtown North Carolina.

But wait, "What could be cooking in that fertile Shark-oriented, Yankee brain" you ask? Well, I've done one engine and three engine versions and four is out! I guess that leaves, two.

Some years ago a person whose expertise I respect suggested that by offsetting each of the twin's engines outboard by at least eight degrees that any engine-out event would be manageable. I have been tempted to test that theory. Alas, in the recent past I could be quoted as having said that if I even built another multi-engine craft that the motive power would be electric. Good thing I never put that in writing... "

I've no doubt that this column's readership salutes you, Raymond. The challenge of multiple glows on a micro model is truly in the spirit of SMA/old school single channel inventiveness. I know that today many would say that it's easier to do the same thing with electrics, but it ain't the same, is it?




Now this is the way to set up a workshop! (Your author takes note...) Chris Moes from Canada started this self- build with local specialist help last summer and has just moved operations indoors. Reckon you could fly in there, Chris! Any more DIY builds out there?

A Real 'Building' Project...

Just as I was getting excited at the prospect of setting up a model workshop in my new home, a mail from our Canadian correspondent and top Traplet designer Christian Moes rather put things in perspective.

Chris has just realised a longtime ambition to build his own purpose-designed workshop and has sent in some pictures of progress from concrete-pouring to completion.

Chris writes: *"I feel a bit strange even mentioning my 'spacious' new workshop, as I realize things are very different in Britain compared to Northern Ontario. We are very fortunate to live in this part of the world. It was built to 'modern' residential standards – which is better than many people's (older) homes.*

When we first moved to this location in 1980 – we lived for 5 years in a caravan (mobile home) 60 ft x 12 ft wide with a long narrow hallway (suitable for control lines, but never tried it!). Sometimes I've thought of those 'good old days' as I was building my workshop. My father was a good carpenter and had a Dutch carpenter friend 'Roelof', nicknamed "Roef" (roof!) which seems appropriate for the trade.

As a lad, I had the fortune to watch these guys build a cabin, my dad's garage, and grandmother's house. I was fascinated – and eager to gather the wood scraps, nails, etc. and 'borrowed' tools for my own 'projects'. It's a wonder I survived!

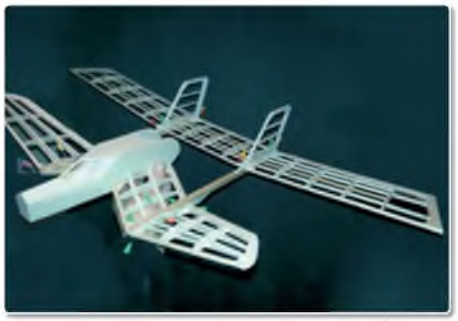
Many years later, when we built our house back in 1985 (to my own design) we had lots of help along the way – and hired out speciality tasks like concrete, plumbing and electrical. Fast forward... six years now since I retired – and a new workshop has been my dream for last fifteen years or so – so I (finally) decided to take the plunge last summer.

Our old 'barn' was built on the cheap as a 'temporary' cattle barn by a hillbilly in his seventies who scoffed at things like building codes – or any manner of authority for that matter. He was a moonshiner, hustled at the pool hall, drank and smoked his whole life, and lived until he was a 104! A local legend...

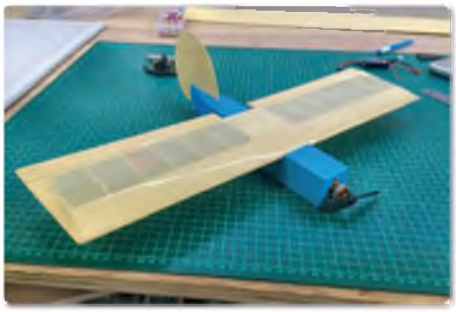
The old barn is beyond repair now – and becoming unsafe – so this added impetus for a new structure this year. It has equivalent space of a large two car garage (24 ft x 28 ft) – but only one garage door – with the south half designated as workshop space – with well lit workbench (lots of windows!)."

Thanks, Chris, we look forward to seeing what emerges from it! A magnificent effort that's obviously taken a lot of hard work in its conception and construction. I'll never take any workshop for granted again! If any other readers have built their own modelling premises in any form we'd like to hear about them.

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

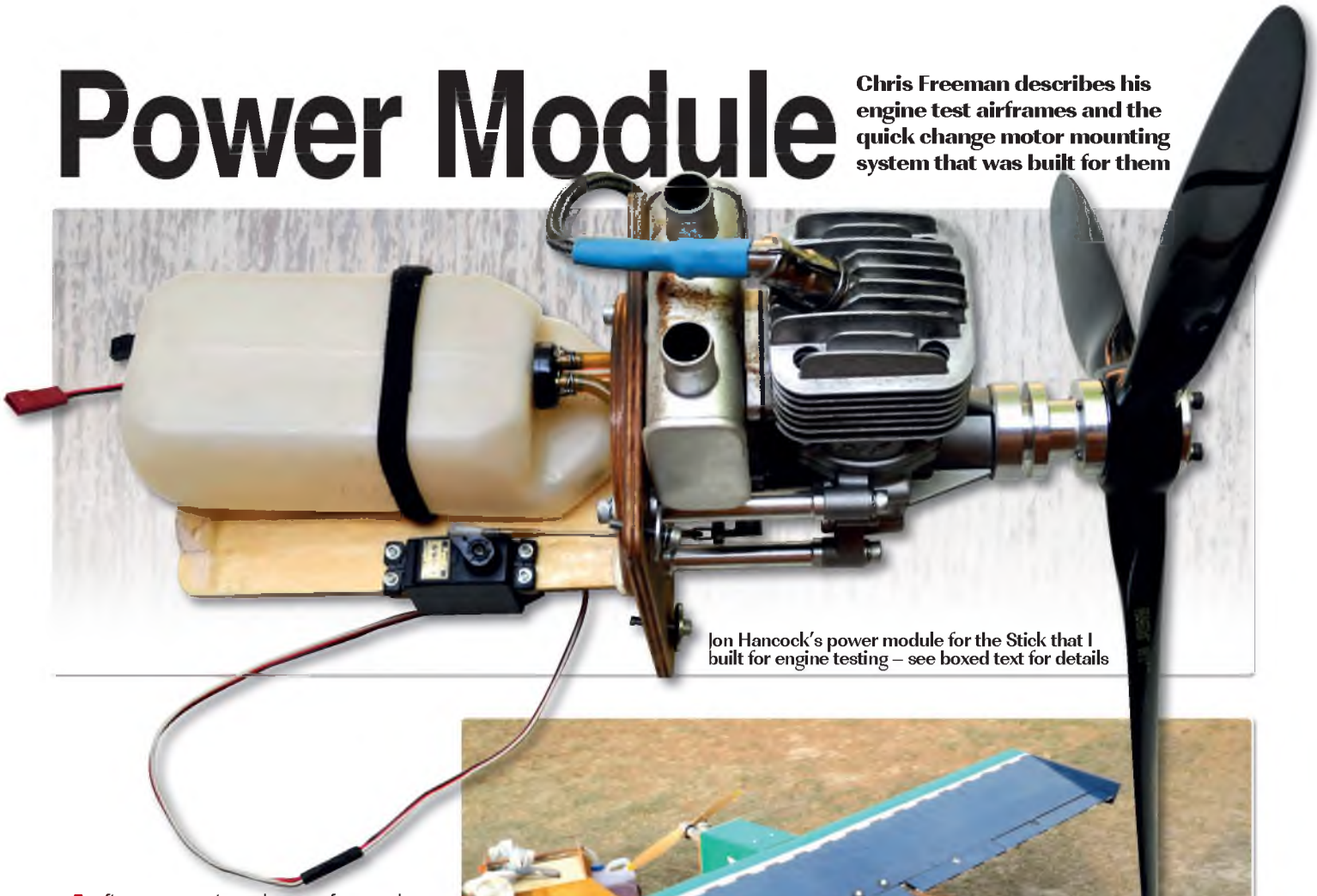
SC's near neighbour, F/F genius and Nats winner Dan Mellor tackled the bizarre 'Bonnacon' canard by Performance Kits' Peter Fisher over the winter. Seen at that exciting stage in the build when components are first pinned together to check the fit. Dan reports that construction of the fuselage pod and negative gull dihedral foreplane was not as straightforward as the plan showed! Destined for diesel power and one of Dan's immaculate, tasteful finishes



Bet this'll get some fan mail too! Another SMA subject from last winter is this Dereck Woodward designed 'Tiny Bit', built by Steve Burns of the North Oxfordshire MAC. The Baby brother of Dereck's 'Little Bit' which Steve has also electrified. As an early adopter of electric power, Dereck would have approved

Power Module

Chris Freeman describes his engine test airframes and the quick change motor mounting system that was built for them



Jon Hancock's power module for the Stick that I built for engine testing – see boxed text for details

After my recent purchases of second-hand engines and the repair of some fire damaged engines, I decided that I needed a test airframe that would be easy to build, and light and easy to fly. Those who have been in the hobby awhile would know that this would mean a Stick! This is an easy to build aircraft that has a large hatch on top for the fuel tank and a flat firewall with no cowl for easy engine access. The airframe is not C of G critical so engine weight could vary a bit without too much of a problem.

I found that when I have changed engines on airframes, especially when changing from a 2-stroke to a 4-stroke, the change in tank positions and throttle linkages quickly results in a firewall that looks like a Swiss cheese full of holes!

I needed to test engines from 25 to 45 cc so a 2 metre Stick with a fully built up fuselage was drawn up. The wings are foam and the control surfaces are sheet with strip wood added. I decided to add flaps and tip plates to improve the slow flight performance. I made the fuselage wider and deeper so that the firewall could accommodate a hole cut out to the diameter of a Super Tigre mount, so that the nuts and bolts for the engine mounts would not interfere when the dummy firewall was mounted to the main firewall.

A removable plate was made for the fuel tank, which could also be used for ESC and batteries if an electric set-up was to be tested. The tank plate was held on with four screws and the firewall with four bolts into blind nuts.

Test flights quickly confirmed that the airframe was great and also confirmed that the engine access was good, as the motor had to be worked on to get reliable engine runs.

Nothing like a test flight to see if you got it right! The Stick flies so well that a 11 year old used it to earn his B certificate

At this time a friend of mine was busy building a Nick Ziroli DC3. He was looking to build a large Stick so that he could test run the motors that had been purchased for the DC3. He wanted to have 10 flights with each motor before trying them on the DC3. I offered the Stick to Jon on loan, as this is what it was built to do. Jon collected my firewall template that I had made, which had the holes drilled in it for the attachment bolts, so he could make up his own 'Power Module', as he called it.

The Power Module had the tank, ignition module, battery and servo all attached to the dummy firewall in such a way that it would fit through the hole in the firewall. Four bolts threaded into blind nuts and plugging in the throttle servo or ESC to the extension lead is all that is needed to change the Power Module.

I had started my next project, which was a 1/4 scale Piper Tri-pacer, scratch built but based on a old Cambrian Models kit, so I started to consider the power options that I had available. I enjoy electric motors but needed to see what sort of power they produce and also see the prop size that best suited them, as many cheaper motors have KV ratings that are not accurate.

Enter The Eindecker

I have a 400 KV Power 60 in a Spitfire that uses the same prop as my 5055 KV 580 motor on a 6-cell LiPo. I also had 90, 120 and a 100 twin four-stroke motors that needed to be tested and the Stick was too big for these motors.

I decided that I had enough Sticks so I elected to build an Eindecker type airframe that would be big enough to give the motors

a decent workout and also provide a better indication as to what size and weight aircraft that they could power.

The Eindecker was a good choice because if built with plug-in wings then you can have a large hatch to access all the equipment and change batteries easily. The airframe also had lots of strip wood in it, so I could build the airframe whilst on a long visit to my mother-in-law. I found an old magazine article with a reduced size plan, so I enlarged it to the size that I wanted and made a few changes to the structure to suit my needs.

I cut all the parts and made up a kit before we left for the coast to visit my mother-in-law. The basic structure was built over a four day period on her coffee table (suitably protected!) in the lounge. The plug in wings caused the most head scratching as I could not get the wings to slide onto the aluminium joiner easily. I thought that my fibreglass outers were the problem but eventually I came to the conclusion that the aluminium tube that I had purchased from a DIY store was not perfectly round.

Once I had this sorted I could find the position needed for the wings to slide onto the joiner without brute force being required. The Eindecker was soon ready to cover and I decided to use some of the Solartex covering that had survived a fire in my house. I had about 20 rolls of covering in a box and because the covering was tightly packed oxygen was in short supply, so the bottom parts of the rolls were not burnt. I now call this covering pre-shrunk Firetex! The covering worked well and gave the airframe a rather unique smell...

I installed all the equipment and made up a Power Module to hold a 5050 2000 watt motor, with a 5000 mAh 6-cell LiPo and an 80 amp ESC. I did not weigh the airframe but it is 2 metre wingspan, covered in 'tex and clear coated with 2k paint, so it is not that light.

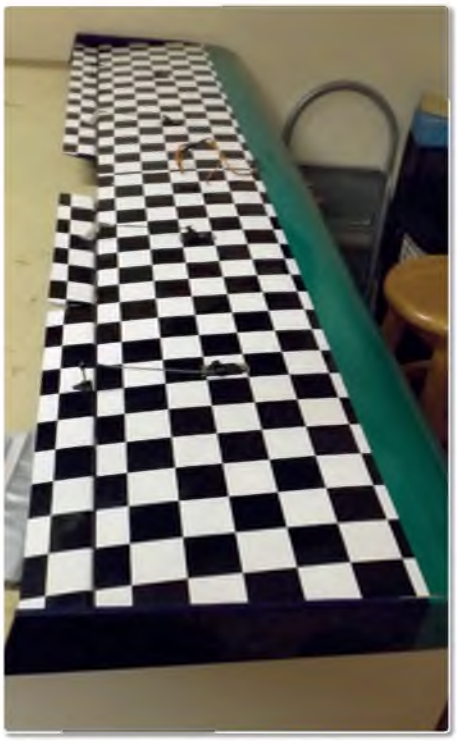
I was not sure what sort of performance to expect so it needed a trip to the flying field early one morning to see if it all worked. Take-off was at just over 1/2 throttle so the power question was answered. The airframe needed a little trimming so I did not build it too askew. The undercarriage was the biggest problem so some more bracing was added, but this was as it is on the full size airframe.

Further flights confirmed the power was good and that the airframe was sound. It's not the best flying plane that I own but it's still nice for the intended purpose. I wanted to let the airframe earn its colours, so as I flew it more I added the crosses, machine gun, pilot and elastic rigging. This made the Eindecker look quite good, in my opinion.

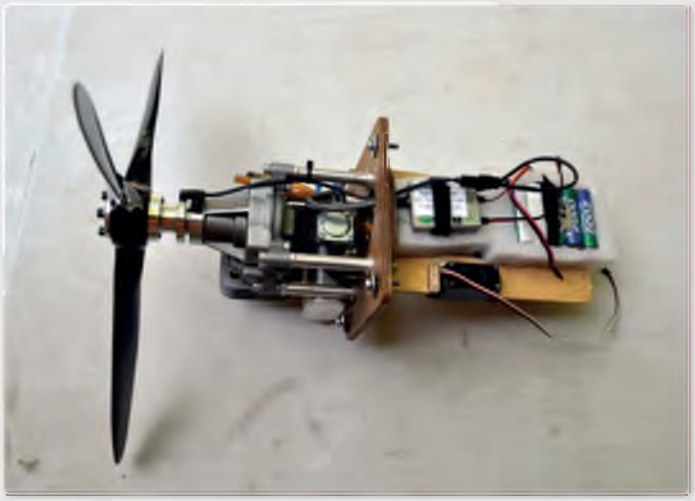
The Stick's sturdy structure is built up with balsa sticks, making it light and economical to build

Engine mounting with a 25 cc Super Tigre motor that I was given

Bright colours help with orientation



Wing servos and pushrod detail. The control surfaces are a little thicker than the trailing edge of the wing to improve effectiveness and reduce the chances of flutter



This engine, being tested prior to fitting in Jon Hancock's DC3, is a DLE 35 RA with a 590 cc fuel tank. The module contains everything to run the engine and is removed, complete, by the removal of four bolts. This allows for the assembly of the module outside of the aircraft. It also provides for the running of the engine, and its module, in the aircraft or on a simple test stand

Electric Versus Glow Comparison

The next motor tested was a Saito 100 Twin that my son had purchased second-hand. It had been stripped and the bearings replaced so it needed to be tested. A Power Module was made and the motor really looked good on the airframe, despite the cowl not being fitted. No additional weight was needed for the C of G and it was soon time to test.

The trip to the flying field proved that the motor runs very well but does not have as much power as the electric set up. The difference in power characteristics also showed when landing, as with electric motor the prop is often stopped, like a dead stick landing with a glow motor, but the prop blast from the Saito on idle appears to make the smallish rudder more effective. I hope to one day test both Power Modules on the same day to make a better comparison between the two power sources.

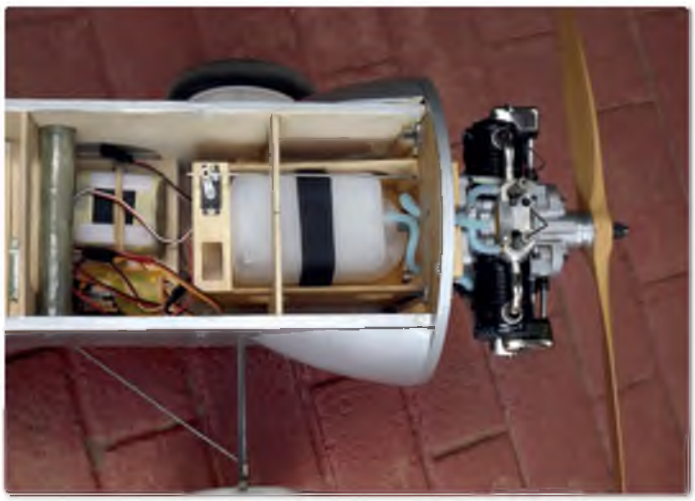
Jon has now had in the region of forty 20 minute flights with the Stick and I have had around 15, so the airframe is good. The Eindecker has had around 20 flights and other than my poor soldering on the undercarriage the airframe has held up well. This has been a very worthwhile build that means I can build and power my next scale project knowing exactly what the power plant is capable of. ***RCMW***

Eindecker ready for a test flight. She still has to earn her colours...

Elevator and rudder are operated using pull/pull cables

All the detail now added, with elastic rigging for appearance only

Glow and electric 'power modules' with all the required bits for each form of propulsion



A large hatch makes access easy

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FULL SET (SET2542) £60.30

Designer: Duncan Hutson
Wingspan: 62.5" / 1585mm
Power Source: .40 2-stroke or .45 4-stroke

LUTON MINOR — MW2536

PLAN (MW2536) £18.50
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FG FAIRING (CF2536FG) £11.50
FULL SET (SET2536) £103.94

Designer: Duncan Hutson
Wingspan: 62.5" / 1585mm
Power Source: .40 2-stroke or .45 4-stroke

PITTS SPECIAL S-2A — MW2538

PLAN (MW2538) £19.50
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CANOPY (CA2538CY £6.50
FG SPATS (CF2538ST) £20.50
FULL SET (SET2538) £134.09

Designer: Duncan Hutson
Wingspan: 55" / 1396 mm
Power Source: .61 2-stroke or .90 4-stroke

FOURNIER RF5 90 — MW3662

PLAN (MW2535) £22.50
LASERCUT WOODPACK (WP2535) £91.99
ABS COWL (CA2535CL) £18.50
CANOPY (CA2535CY £15.50
FULL SET (SET2535) £133.64

Designer: Duncan Hutson
Wingspan: 90" / 2285 mm
Power Source: .30 - .40 2-stroke or .40 4-stroke

DH82A TIGER MOTH 88 — MW3208

PLAN (MW3208) £43.50
LASERCUT WOODPACK (WP3208) £98.99
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WHEEL SET (WHL3208SET) £24.50
DECAL SET (DEC3208) £18.50
FULL SET £310.48

Designer: Duncan Hutson **Wingspan:** 88" / 2.230 m
Power Source: .1.20-1.80 4-stroke

WESTLAND LYSANDER 70 — MW2545

PLAN (MW2545) £22.50
LASERCUT WOODPACK (WP2545) £42.99
CANOPY (CA2545CY) £15.50
FG COWL (CF2545CL) £21.50
FG SPATS (CF2545ST) £21.50
FULL SET £111.59

Designer: Duncan Hutson
Wingspan: 70" / 1778 mm
Power Source: .40 2-stroke or .40 - .48 4-stroke

JODEL D112 — MW2537

PLAN (MW2537) £17.50
LASERCUT WOODPACK (WP2537) £103.99
CANOPY (CA2537CY) £15.50
FG COWL (CF2537CL) £19.50
FULL SET £140.84

Designer: Duncan Hutson
Wingspan: 68" / 1727 mm
Power Source: .61 2-stroke

AVRO ANSON — MW2544

PLAN (MW2544) £27.50
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FG TAIL FAIRING (CF2544FG) £9.50
FULL SET £192.14

Designer: Duncan Hutson **Wingspan:** 84" / 2134 mm
Power Source: 2 x .30 2-stroke

HAWKER TEMPEST MK.V (61.5") — MW3328

PLAN (MW3328) £22.50
LASERCUT WOODPACK (WP3328) £88.99
CANOPY (CA3328CY) £7.50
ALUMINIUM SPINNER SET (CS3328SET) £22.99
FG COWLS (CF3328CL) £42.50
FULL SET £166.03

Designer: Brian Taylor
Wingspan: 61.5" (156.21cm)
Power Source: .60 cu. in. 2-stroke

MESSERSCHMITT ME163 KOMET (49.75") — MW3347

PLAN (MW3347) £17.50
LASERCUT WOODPACK (WP3347) £51.99
CANOPY (CA3347CY) £7.50
COWL (CF3347CL) £13.50
FULL SET (SET3347) £81.44

Designer: Brian Taylor
Wingspan: 49.75" / 1265 mm
Power Source: .30 cu. in. 2-stroke

CHANCE-VOUGHT F4U-1 CORSAIR (61.5") — MW3349

PLAN (MW3349) £20.50
LASERCUT WOODPACK (WP3349) £58.99
CANOPY (CA3349CY) £7.50
COWL (CF3349CL) £23.50
DOMED PROP NUT-PIP (SMALL) (CD3349SP) £12.50
FULL SET (SET3349) £110.69

Designer: Brian Taylor **Wingspan:** 61.5" / 1562 mm
Power Source: .60 cu. in. 2-stroke
(or equivalent 4-stroke)

CESSNA 120 (62") — MW3346

PLAN (MW3346) £20.50
LASERCUT WOODPACK (WP3346) £48.99
PETG CANOPY SCREEN(CA3346CY) £12.50
COWL (CF3346CL) £23.50
FULL SET (SET3346) £94.94

Designer: Duncan Hutson
Wingspan: 62" / 1575mm

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PLAN (MW3334) £22.50
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COWL (CF3334CL) £37.50
FG ALT. COWL CHIN (CF3334AUX) £12.50
ALUMINIUM SPINNER SET (CS3334SET) £22.99

FULL SET (SET3334) £190.78

Designer: Brian Taylor **Wingspan:** 69" / 1753 mm
Power Source: .75 - .80 cu. in. 4-stroke or .60 cu. in. 2-stroke

REPUBLIC P-47D THUNDERBOLT (RAZORBACK) MW3335

PLAN (MW3335) £24.50
LASERCUT WOODPACK (WP3335) £118.99
CANOPY (CA3335CY) £11.50
COWL (CF3335CL) £45.50
ABS DROP TANKS (CA3335TK) £8.50
DOMED PROP NUT (LARGE) (CD3335SP) £9.50

FULL SET (SET3335) £196.64

Designer: Brian Taylor
Wingspan: 76" / 1930 mm
Power Source: 1.20 to 1.50 cu. in. 4-stroke

GLOSTER GLADIATOR (56") MW3344

PLAN (MW3344) £22.50
LASERCUT WOODPACK (WP3344) £95.99
CANOPY (CA3344CY) £7.50
COWL (CF3344CL) £24.50
ALUMINIUM SPINNER SET (CA3344SET) £22.99

FULL SET (SET3344) £156.13

Designer: Brian Taylor
Wingspan: 56" / 1422 mm
Power Source: .60 cu. in. 2-stroke (equivalent 4-stroke

AVRO 621 TUTOR MW3441

PLAN (MW3441) £28.50
LASERCUT WOODPACK (WP3441) £95.99
COWL (CF3441CL) £20.50

FULL SET £130.49

Designer: Dennis Bryant
Wingspan: 68" / 1730 mm
Power Source: .60 cu .in. 2-stroke

SUPERMARINE SPITFIRE MK.22 (61") MW3452

PLAN (MW3452) £27.50
LASERCUT WOODPACK (WP3452) £73.99
CANOPY (CA3452CY) £12.50
ALUMINIUM SPINNER SET (CS3452SET) £24.99
FG COWL (CF3452CL) £19.50

FULL SET (SET3452) £142.63

Designer: Dennis Bryant
Wingspan: 61" / 1550mm
Power Source: ..60 cu. in. 2-stroke

ROLLASON TURBULENT (63") MW3440

PLAN (MW3440) £28.50
LASERCUT WOODPACK (WP3440) £73.99
FG COWL (CF3440CL) £21.50

FULL SET (SET3440) £111.59

Designer: Dennis Bryant
Wingspan: 63" / 1600 mm
Power Source: .40 to .60 cu. in. 2-stroke

MILES M.5 SPARROWHAWK (63") MW3459

PLAN (MW3459) £27.50
LASERCUT WOODPACK (WP3459) £100.99
FG COWL (CF3459CL) £13.50

FULL SET (SET3459) £127.79

Designer: Dennis Bryant
Wingspan: 63" / 1600 mm
Power Source: .40 to .60 cu. in. 2-stroke

HENSCHEL HE 126A-1 (77") MW3456

PLAN (MW3456) £32.50
LASERCUT WOODPACK (WP3456) £108.99
CANOPY (CA3456CY) £13.50
ALUMINIUM SPINNER SET (CS3456SET) £22.99

FULL SET (SET3456) £177.98

Designer: Dennis Bryantr
Wingspan: 77" / 1956mm
Power Source: .60 to .90 cu. in.

FIESELER FI-156 STORCH (93") MW3466

PLAN (MW3466) £32.50
LASERCUT WOODPACK (WP3466) £108.99
FG COWL (CF3466CL) £35.50

FULL SET (SET3466) £159.29

Designer: Dennis Bryan
Wingspan: 93" / 2362 mm
Power Source: .60 4-stroke; .90 4-stroke

WESTLAND WIDGEON III (72") MW3443

PLAN (MW3443) £24.50
LASERCUT WOODPACK (WP3443) £110.99

FULL SET (SET3443) £121.94

Designer: Dennis Bryant
Wingspan: 72" / 1829 mm
Power Source: .60 cu. in. 2-stroke

MILES M.14 MAGISTER (68") MW3446

PLAN (MW3446) £27.50
LASERCUT WOODPACK (WP3446) £100.99
COWL (CF3446CL) £13.50
FULL SIZE FOCUS CD (FF29) £4.99

FULL SET (SET3446) £150.96

Designer: Dennis Bryant
Wingspan: 68" / 1727mm
Power Source: .40 to .60 cu. in. 2-stroke

DCH-1 CHIPMUNK (68")) MW3444

PLAN (MW3444) £27.50
LASERCUT WOODPACK (WP3444) £71.99
COWL (CF3444CL) £22.50
CANOPY (CA3444CY) £20.50

FULL SET (SET3444) £128.24

Designer: Dennis Bryant
Wingspan: Up to 24"
Power Source: IC Propeller

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PLAN (MW3668) £22.50
LASERCUT WOODPACK (WP3668) £90.99
CANOPY (CA3668CY) £20.00
FULL SET (SET3668) £142.63

Designer: Philip Noel
Wingspan: 39" (990 mm)
Power Source: (Wren MW44/54 or similar)

MESSERSCHMITT ME 262 — MW3666

PLAN (MW3666) £22.50
LASERCUT WOODPACK (WP3666) £87.99
CANOPY (CA3666CY) £7.50
FULL SET (SET3666) £106.19

Designer: Philip Noel
Wingspan: 50" (1270 mm)
Power Source: 2 x 70mm Wemotec 480 Fan units

DH110 SEA VIXEN — MW3659

PLAN (MW3659) £22.50
LASERCUT WOODPACK (WP3659) £87.99
CANOPY (CA3659CY) £11.50
FULL SET (SET3659) £109.79

Designer: Philip Noel
Wingspan: 50" (1270 mm)
Power Source: 2 x Airpower/ Wemotec 70mm fan units

DH MOSQUITO — MW3661

PLAN (MW3661) £22.50
LASERCUT WOODPACK (WP3661) £107.99
CANOPY (CA3661CY) £7.50
ABS COWL (CA3661CL-SET) £7.50
FULL SET (SET3661) £145.49

Designer: Philip Noel
Wingspan: 50" (1270 mm)
Power Source: 2 x Airpower/ Wemotec 70mm fan units

DASSAULT MIRAGE 5/50 — MW2479

PLAN (MW2479) £15.50
CANOPY (CA2479CY) £6.50
FULL SET (SET2479) £19.80

Designer: Philip Noel
Wingspan: 43" /1090 mm
Power Source: .45 2-stroke & 5" tractor fans

LOCKHEED SUPER CONSTELLATION — MW3663

PLAN (MW3663) £31.50
LASERCUT WOODPACK (WP3663) £161.99
ABS COWL (CA3663CL) £23.50
FULL SET (SET3663) £195.29

Designer: Philip Noel
Wingspan: 88" (2235mm)
Power Source: 4 x Speed 480 or eqivalent

B25 MITCHELL — MW3660

PLAN (MW3660) £22.50
LASERCUT WOODPACK (WP3660) £81.99
ABS COWL (CA3660CL) £7.50
CANOPY (CA3660CY-SET) £9.50
FULL SET (SET3660) £109.34

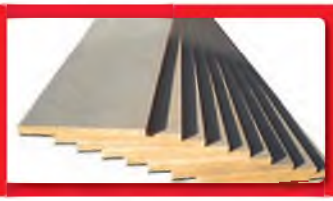
Designer: Philip Noel
Wingspan: 50" (1270mm)
Power Source: Geared speed 480 or 2822 Brushless Motor

GRUMMAN F7F TIGERCAT — MW3662

PLAN (MW3662) £22.50
LASERCUT WOODPACK (WP3662) £72.99
ABS COWL (CA3662CL) £7.50
CANOPY (CA3662CY £7.50
FULL SET (SET3662) £99.44

Designer: Philip Noel
Wingspan: 40" (1016 mm)
Power Source: Geared speed 480 or brushless equivalent

NEW! Complete your project with our Balsa Woodpacks – strip and sheet packs available.



Strip Wood - Pack A
- 6 x 1/8" (3.2 mm)
- 6 x 3/16" (5 mm)
- 6 x 3/32" (2.4 mm)
- 4 x 1/8"X1/4" (3.2mm X 6.5 mm)
- 6 x Spruce...

Rrp £10.99 + p&p/s&h

Strip Wood - Pack B
- 9 x 1/8" (3.2 mm)
- 10 x 3/16" (5 mm)
- 10 x 3/32" (2.4 mm)
- 6 x 1/8"X1/4" (3.2x6.5 mm)
- 10 x Spruce...

Rrp £17.82 + p&p/s&h

Strip Wood - Pack C
- 14 x 1/8" (3.2 mm)
- 14 x 1/8" (3.2 mm)
- 14 x 3/16" (5 mm)
- 14 x 3/32" (2.4 mm)
- 10 x 1/8"X1/4" (3.2x6.5 mm)
- 15 x Spruce...

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Strip Wood - Pack D
- 14 x 1/8" (3.2 mm)
- 14 x 1/8" (3.2 mm)
- 20 x 3/16" (5 mm)
- 20 x 3/32" (2.4 mm)
- 20 x 1/8"X1/4" (3.2x6.5 mm)

Rrp £21.62 + p&p/s&h

Sheet Wood - Pack A
- 2 x 1/8" (3.2 mm)
- 2 x 3/16" (2.4 mm)
- 2 x 3/16" (5 mm)
- 5 x 1/16" (1.6 mm)
- 1 x 1/4" (6.5 mm)

RRP £21.13 + p&p/s&h

Sheet Wood - Pack B
- 3 x 1/8" (3.2 mm)
- 4 x 3/32" (2.4 mm)
- 4 x 3/16" (5 mm)
- 8 x 1/16"x1/4" (1.6 mm)
- 2 x 1/4" (6.5 mm)

RRP £37.51 + p&p/s&h

Sheet Wood - Pack C
- 6 x 1/8" (3.2 mm)
- 6 x 3/32" (2.4 mm)
- 6 x 3/16" (5 mm)
- 10 x 1/16" (1.6 mm)
- 4 x 1/4" (6.5 mm)

RRP £50.56 + p&p/s&h

Sheet Wood - Pack D
- 10 x 1/8" (3.2 mm)
- 10 x 3/32" (2.4 mm)
- 10 x 3/16" (5 mm)
- 14 x 1/16" (1.6 mm)
- 6 x 1/4" (6.5 mm)

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INDOOR

26th Apr, 31st May, 28th Jun

Indoor R/C Small Models Meets, in the Main Hall at Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL. All meetings will run from 7.00 pm to 9.30 pm. Models to be flown at these meetings are to be limited to a maximum weight of 95 grams (3.5 ounces) for fixed wing aircraft, in flight trim, including battery (not to exceed a 2-cell LiPo pack). Helicopters are to be limited to a rotor diameter of 12" (305 mm). All models will be weighed before flight, and will be judged on their suitability for the venue on the evening. Admission to the meetings will be £4 for flyers and £1 for spectators. Flyers will be required to show proof of insurance. For further details please contact: Alan Wallington, 'Wrenbeck', Bull Lane, Waltham Chase, Southampton, Hants. (Tel. 01489 895157) or see our website: www.wcaero.co.uk

7th May, 4th Jun, 2nd Jul, 1st Oct, 5th Nov, 3rd Dec '16

Fun Flying at Potters Bar, at Furzefield Sports Centre, Mutton Lane, Potters Bar, Herts. EN6 3BW. From 6 pm until 10 pm, flyers £9, spectators £2. Small rubber free flight and small electric models, wingspan will be limited to 20". All enquiries to Mike Quille, Tel: 020 8500 3549,
Email: mp.quille@live.co.uk

1st May '16

BMFA Scale Indoor Free Flight Nationals, will be held in the same venue as last year, the University of Wolverhampton Sports Centre. Official events will include free flight competitions for Open Rubber, CO2/Electric, Peanut, Pistachio, Kit Scale and the newly introduced Glider class. Please refer to the 2016 BMFA Scale Rule Book and the BMFA Scale Judges Guide. Pre-entry to the main events must be made by Friday 15th April 2016. Unofficial competitions will be held for Air Race and Mass Launch – these are free entry on the day to competitors. There will be an additional £6.00 entry fee for non-competitors. Pre-entry for this is not required. A raffle will be held for aviation and modelling related goodies – please help to make it successful by bringing and donating a prize. Access to the site and parking facilities are excellent and there is a viewing gallery with a restaurant that will be open all day. Doors open at 8.00 am and will close at 6.00 pm. Competitors: pre-entry only, Spectators: £6.00, Accompanied children and those under 18 years: free.
Contact the organiser for the official competition entry form and/or more information,
Graham Banham: gray4990@yahoo.co.uk,
07951 390473 or John Minchell:
j.minchell@btinternet.com, 07989 744251

8th Oct, 12th Nov, 10th Dec

North London MFC Indoor R/C Meetings, at Furzefield Sports Centre, Potters Bar, Herts. EN6 3BW (Junction 24/M25), 6 pm -10 pm. All up weight limit for fixed wing 225 g, 36 inch span, Helicopters 400 g. BMFA insurance required. Admission: flyers £9, spectators £2.50. For more information contact Peter Elliott on 01707 336982

GENERAL

23rd & 24th Apr '16

Spalding Model Engineering & Hobby Show, 9.30 am Saturday until Sunday 4.30 pm, at the Springfield Centre, Camelgate, Spalding, Lincs. PE12 6ET 3. Halls exhibiting R/C trucks/plant in extensive working diorama, model boating pool, indoor flying area, alongside traditional engineering, Gauge 1 railway layout, 5" live steam railway rides, live steam outside, R/C tank demonstrations, trade stands, catering & much more. Fun for the R/C enthusiast and all the family. Show adjacent to large shopping outlet and acres of gardens to enjoy. Email: spaldingshow@gmail.com,
Tel: 07443 524260 www.spaldingshow.com

23rd & 24th Apr '16

NYE Jets 2, the second Nye Jets kero burn will take place at Throckmorton Airfield, Long Lane, Throckmorton, Worcestershire WR10 2JH. Absolutely NO ENTRY after the cut-off date of April 15th. The event will be fly for fun for jet models only (no pulse jets, prop jobs or helicopters). Pilots must be current BMFA/LMA/SAA members and B certificate qualified as a minimum (including both pilots if a buddy-box system is in use) NO INSURANCE & NO B CERTIFICATE = NO FLYING. Models weighing over 20 kg and subject to the LMA Large Model Scheme certification are to be made known to Jamie Cuff (see email), certificates will be required as proof of scheme compliance before the model(s) are allowed to fly. IT IS THE PILOT'S RESPONSIBILITY TO MAKE THE EVENT ORGANISER AWARE OF ANY OVER 20 KG MODELS. All models will be scrutinised and flying will take place from 10 am through until 6 pm. There will be LMA Scheme flight witnesses available over the weekend if required. Entry fees are as follows: Pilots: £16 per day, Others £6 per day. For more detailed information and an Entry Form email: nyejets@yahoo.co.uk

30th Apr/1st May '16

IMAC UK Competition, at Castle Kennedy Airfield, Nr Stranraer, Scotland. Point of contact for information etc. is Mal Green at mcgreen65@hotmail.com

1st May, 4th Jun, 2nd Jul, 6th Aug, 3rd Sep, 1 st oct, 5th Nov, 3rd Dec '16

Wessex Soaring Association Fly-Ins, held on the first Saturday or Sunday of the month, depending on the forecast. Slopes located in South Wiltshire, approx 10 miles west of Salisbury. All welcome. Contact Pete Carpenter on 07919 903742 or pete.carpenter@yahoo.co.uk for details

1st May '16

F3A. BMFA 2nd GBR Team Selection Event, Hurley. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See gbrcaa.org – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Adrian Harrison on 07976 244004 for details

7th May '16

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, Bob Rowland on 07969 456441 for details

15th May '16

Traplet Flying only Scale Round 1, at Pontefract and District Aeromodellers, West Yorkshire, WF8 4QD, 10 am – 5 pm. Sponsored with prizes by Traplet. The only requirement is that the plane is a recognisable version of a full size fixed-wing aircraft. There is no builder of the model rule so ARTF's and ready-made models can be used. Pilots of models weighing over 7 kg need a 'B' certificate to fly. Flying schedules and further information from Peter Maw at: secretary@bickershawmfc.co.uk

21st & 22nd May '16

PSSA 'Fly for Fun', The Blwch, Bridgend, South Wales. Meet at the 'Ice-Cream' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Steve Houghton on 07762 256126 or Email: Steve.houghton59@gmail.com
Further information at a470soaring.blogspot.co.uk

21st & 22nd May '16

LMA Swapmeet, at the Tibenham model event, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883,
Email: topgun@modelpilot.co.uk

21st & 22nd May '16

IMAC UK Competition, at Cashmoor, Dorset. Point of contact for information etc. is Mal Green at mcgreen65@hotmail.com

22nd May '16

GBR/CAA F3A League competition, Deeside. 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, Brian Hoare on 07962 358470 for details

22nd May '16

White Sheet Scale Fly-In, to be held at the White Sheet Club slopes near Mere, Somerset (back up date 5th June). No competition, just a friendly fly-in. Proof of insurance, please. Further information from c_williams30 @sky.com. Go-No-Go decision the evening before on the WS and SSUK forums www.whitesheet.org.uk, scalesoaring.co.uk

28th & 29th May '16

F3A World Cup League Event, Criterium International du Hainaut Grandrieu, Belgium. Please contact Ashley Hoyland on 0114 2873432 for details

3rd June '16

Bretons MFC Swap 'N' Meet, first Swap 'n' Meet Social Evening at the Bretons Community Hall, Rainham Road, Rainham Essex RM13 7LP. From 7 pm till 10pm. Emphasis is on the meet and socialising for this new event in the modellers' calendar. Come along, relax and meet fellow model flyers from across the county. There will be no commission taken or booking fees. Light refreshments will be available; Tea/Coffee and BBQ (weather permitting). Entry £2.00. Table space for sellers is allocated on a first come basis.
Contact: info@bretonsmfc.org.uk

5th Jun '16
F3A. 3rd BMFA GBR Team Selection Event, Ashbourne, Derbyshire. FAI 'P' and 'F' schedules. Also GBR/CAA League competition, all schedules. See gbrcaa.org – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome, please contact Contest Director, Adrian Harrison on 07976 244004 for details

5th Jun '16
North London MFC Scale Day, at Warren Lane, Baldock, Herts SG7 6RR. Flying from 10 am. BBQ and drinks available. All pilots need BMFA A certificate or LMA proficiency, those flying >7 kg models need BMFA B certificate or LMA proficiency. Proof of insurance required. No noisy models please. £5 pilots entry fee. Contact Maurice Northcott on 07866 105721 or Email: mail@mpnltd.fsnet.co.uk

10th, 11th & 12th Jun '16
UK F3A World Cup League Event, Near Ashford, Kent. International entry. Visitors welcome. See www.gbrcaa.org/World Cup/ or contact Contest Director Matt Hoyland on 07739 840498 or Ashley Hoyland on 0114 2873432 for more details

11th & 12th Jun '16
PSSA Fly-In and Clwyd SA Ray Jones Memorial PSS event, The Great Orme, Llandudno, North Wales. Meet at the 'Tank Track' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: webmaster@pssaonline.co.uk More details for Sunday's memorial event on the CSA website or Email: Matt Jones at mattjonesgte88@hotmail.co.uk

11th & 12th Jun '16
Opale Fest V2, at Cessieu, Rhone-Alpes, France. 10 am – 4 pm. For all things R/C paragliding, learn from experienced pilots, get tips and trick, and gather knowledge and experience from the experts. Paramotor, Soaring, Towing, Pylon Race, Paraglider Speedrace, FPV flights, competitions and night flying are planned. More details to come. Further info check out www.opale-paramodels.com

17th to 19th Jun '16
Weston Park International Model Air Show, at Weston Park, Weston-under-Lizard, Nr. Shifnal, Shropshire TF11 8LE. Celebrating their 25th anniversary the show starts at 10 am (gates open at 8 am), includes model aircraft displays, on road and circuit model car racing, full size displays, model boats, Quad Fair helifest. On-site camping available. Adults £12, Children £6, Family £28. For more information check out www.westonparkmodelairshow.co.uk Tel: 01952 587298, Mobile 07758 895068

17th, 18th & 19th Jun '16
F3A World Cup League Event, France. Please contact Ashley Hoyland on 0114 2873432 for details

18th & 19th Jun '16
IMAC UK Competition, Wrexham, Flintshire, Wales. Point of contact for information etc. is Mal Green at mcgreen65@hotmail.com

18th & 19th Jun '16
Airborne At The Sumners Ponds Model Show, is now in its fourth year in the lovely surroundings that make up the Sumners Ponds Fishery and Campsite in Barns Green, Horsham, West Sussex. Last year the show attracted over 2000 visitors. New for 2016, FPV Quad Racing will have its own flying field adjacent to the main flight line, as demand has been so high. And there will also be an area put aside for Control Line flying. The main flight line will once again cater for helicopters and aeroplanes. Camping is available on site and is free to all pilots on Friday and Saturday evenings. If you wish to participate please contact Peter Glover (07954 370936) or see the show's Facebook and web pages at: www.facebook.com/airborne.sumnersponds www.sumnersponds.co.uk

25th & 26th Jun '16
F3A World Cup League Event, Netherlands. Please contact Ashley Hoyland on 0114 2873432 for details

25th & 26th Jun '16
30th Wings & Wheels Model Spectacular, at North Weald Airfield, Epping, Essex CM16 6AR. 9.30 am – 5.30 pm. R/C displays of all kinds, trade, Bring & Buy, Boat Pool and lots more. Weekend camping. All enquiries: Email: admin@wingsnwheels.net or Tel: 01242 604126, www.wingsnwheels.net

2nd Jul '16
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, Bob Rowland on 07969 456441 for details

3rd Jul '16
White Sheet Scale Fly-In, to be held at the White Sheet Club slopes near Mere, Somerset (back up date 17th July). No competition, just a friendly fly-in. Proof of insurance, please. Further information from: c_williams30 @sky.com. Go-No-Go decision the evening before on the WS and SSUK forums www.whitesheet.org.uk, scalesoaring.co.uk

9th & 10th Jul '16
IMAC UK Competition, Rhyl, North Wales. Point of contact for information etc. is Mal Green at mcgreen65@hotmail.com

10th Jul '16
F3A. 4th BMFA GBR Team Selection Event, Oxford. FAI 'P' and 'F' schedules. Also GBR/CAA League competition, all schedules. See gbrcaa.org – then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Peter Brett on 07795 061145 for details

10th Jul '16
North London MFC Glider Day. at Warren Lane, Baldock, Herts SG7 6RR. Flying from 10 am. BBQ and drinks available. All pilots need BMFA A certificate or LMA proficiency. Proof of insurance required. No noisy models please. £5 pilots entry fee. Contact Maurice Northcott on 07866 105721 or Email: mail@mpnltd.fsnet.co.uk

16th & 17th Jul '16
LMA Swap Meet, at the Cosford show, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883, Email: topgun@modelpilot.co.uk

17th Jul '16
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

24th Jul '16
GBR/CAA F3A League competition, Mansfield. 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, Stuart Mellor on 01246 568043 for details

31st Jul '16
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

31st Jul '16
Bath SPARCS All Electric Fly-In, at RAF Colerne Wiltshire. Airfield site with grass and tarmac runways. Proof of BMFA insurance required. Regret no facilities for spectators. Pilots briefing at 10 am. Contact: Bob Partington 01225 891441, Email: grpartington@gmail.com

28th Jul to 6th Aug 2016
F3A European Championships, Untermünkheim – Germany. See www.ec-f3a-2016.de/ If you need more details contact Ashley Hoyland on 0114 2873432

7th Aug '16
Traplet Flying Only Scale Round 2, at Bickershaw MFC, Lancashire, WN2 5TD. 10 am – 5 pm. Sponsored with prizes by Traplet. The only requirement is that the plane is a recognisable version of a full size fixed-wing aircraft. There is no builder of the model rule so ARTF's and ready-made models can be used. Pilots of models weighing over 7 kg need a 'B' certificate to fly. Flying schedules and further information from Peter Maw at: secretary@bickershawmfc.co.uk

13th & 14th Aug '16
PSSA 'Fly for Fun' event with the Lleyn MAC, Nr Abersoch, North Wales. Meet at the Londis car park in Llanbedrog for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Phil Cooke on 07772 224719 or Email: webmaster@pssaonline.co.uk

13th & 14th Aug '16
LMA Swap Meet, at the Elvington show, this popular addition to the flying programme does not need to be booked but tables will be allocated on a first come first served basis. Table will cost £10 for 2 days or part thereof. All money raised will be donated to the Vulcan charity. Further details can be obtained from Steve Ogden 01782 853883, Email: topgun@modelpilot.co.uk

13th & 14th Aug '16
IMAC UK Competition Dates, Clitheroe, Lancashire. Point of contact for information etc. is Mal Green at mcgreen65@hotmail.com

14th Aug '16
GBR/CAA F3A League competition, Ashbourne. 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, Adrian Harrison on 07976 244004 for details

21st Aug '16
Deeside M.A.C. Open Event, Broken Bank flying site off the A548 Flintshire. Start time 9 am. All flyers must be B.M.F.A. members be insured with proof of insurance. Max weight of models 30 kg. Models over 20 kg to have C.A.A./L.M.A certification. Models over 7 kg will require a B certificate. The event is a family fun day for the following classes: Fixed wing, I.C./Electric, Turbine. Helicopter, IC/Electric, Turbine. On site, Toilet, Barbeque and a 230 V Ac charging facility, and the site has a take-off strip suitable for large models. The gates will be open from 8.30 am and locked at 10.30 am, however a phone number will displayed on the gate for latecomers. Contact: George Robson for further information and directions. Email: zen219506@zen.co.uk, Tel: 01352761814 or check out the website at www.deesidemac.co.uk

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For sale 95 rare vintage RC airplane and glider kits: Graupner, Robbe, Krick, Rödel, Multiplex, Sterling, Berkeley, Svenson, Hasegawa. List on demand: airxav@hotmail.com. Xavier Schmidt, Geneva, Switzerland.

SiG "Rascal" 110w/span with Saito I-80 engine, needs finishing £400. Zen 26 engine, still boxed £175. Also 26 engine, never started £150. Call 01206 845611 for details. Essex.

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MODEL WORLD Next Issue

DON'T MISS OUR JUNE 2016 ISSUE!

Our Feature Plan for the June issue is an easy to build semi-scale model of Bell's prototype twin-boom fighter from WW2, which evolved into the jet powered P-39 Airacomet. Bill Bowne's 40.5 inch wingspan model flies on a 1400 – 2200 KV brushless motor and 3S LiPo

Terry Westrop reveals all you need to know about joining the retro pattern ship revival. So dust of that old Astro Hog in the loft or build yourself a brand new Kwik Fli and join in the fun

JUNE 2016 ISSUE ON SALE THURSDAY 19TH MAY

Whether it's fitting a moulded cowling to an ARTF kit or building your own radial cowl from scratch, our two cowl based 'how to' articles, courtesy of Chris Bowler and Bill Bowne, will teach you the tricks of the trade and help you make sure that the front of your models are neat and tidy

All contents are subject to change without notice

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

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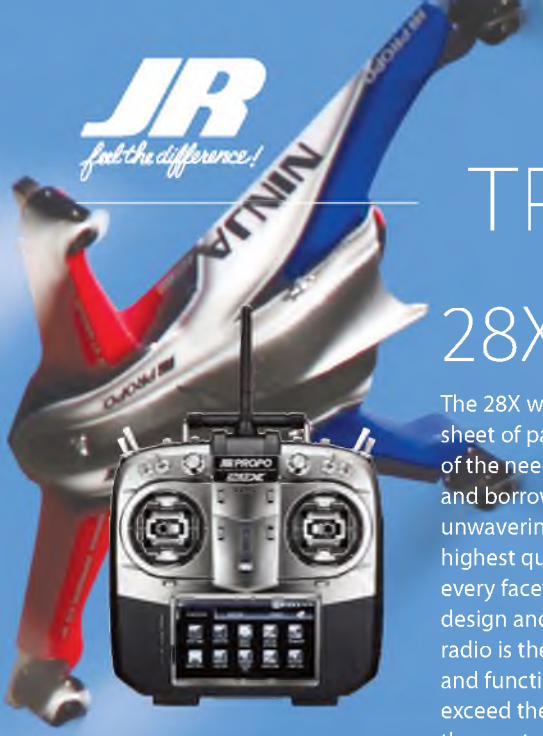

28X

The 28X was born from clean sheet of paper, a fresh perspective of the needs of today's modeller, and borrows from JR's unwavering commitment to the highest quality and precision in every facet of the transmitter's design and manufacture. This radio is the ultimate blend of form and function that is sure to exceed the expectations of even the most discerning modeller.

XG14

The XG14 radio system provides the ability to control popular model types within the Airplane, Helicopter or Glider categories, all from the same transmitter. Special switch labels are provided for each of the 3 categories of models so the pilot can customize the switch labeling for their main model type so these switches are easily identifiable at a glance.

XG11

When JR started designing the XG11, the aim was to provide top pilots with what they needed in a radio. Numerous functional enhancements and user-friendly features ensured a radio suited to any pilot from beginner to expert. A new-generation, long-life Li-Fe battery is used, which contributes to a large reduction in transmitter weight.

XG8

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For 25-35cc Petrol

Bigger Really Does Mean Better!

When a model is as good as the Wots Wot there is only one way to make it better - make it BIGGER! The increase in size has resulted in even better handling, with amazing low speed stability alongside stunning aerobatic capability and precision. Designed around the popular 25 - 35cc petrol engines, but also suitable for larger glow engines. The Wots Wot XL has a fully built-up structure from precision CNC cut balsa and ply, the assembled model then being carefully covered in film, with a fibreglass cowling painted to match. The Wots Wot XL is easy to assemble and disassemble with only 8 bolts allowing both wing panels to separate into halves making it practical to transport or store.

Strong Aluminium Undercarriage

Carbon Wing Spar