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WELCOME

Editor: Kevin Crozier. MyTimeMedia Ltd. Suite 25S, Eden House,
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Well what a crazy time I had putting together the last issue! Just as it was going to press the situation regarding Covid-19 restrictions was very fluid and in just the space of a few days we went from 'go flying but take care' to a full lockdown. Then there were the inevitable changes to the magazine to contend with, which were imposed by MyTime Media's management team across our many titles in order to protect the business as much as possible from the ongoing adverse effects of the current crisis.

For RCM&E these changes take effect from this issue for the foreseeable future and result in a reduction in pagination to 100 pages and just one free pull-out plan instead of two. Thanks to some sterling work by Shaun Garrity, we are experimenting with resurrecting the centre section mini plans that were so popular back in the 1970s, so hopefully you'll enjoy some kitchen table building sessions using them whilst you are 'confined to barracks' - even if you have to carefully open and reclose the staples to get at them!

The Special issue has also been cancelled so we are back to 12 issues for 2020. We are also now working to a greatly reduced budget, so a huge thanks goes out to all our regular and semi-regular contributors who have accepted this with good such grace, even to the extent of some of them offering to contribute for free, such is the goodwill that they have for the magazine. Thankfully that is not necessary but it's nice to know how much love everyone has for Radio Control Models & Electronics.

Model flying on TV is still a relatively rare occurrence, so when it does happen word tends to get around. Most recently the popular Countryfile programme has covered our hobby on a couple of occasions, prompting the following letter from Ian Perry:

"You may be interested that my primary club, the Leighton Buzzard based 'The Buzzard Flying Club', was the club used in the BBC Countryfile programme in December. As the club's web master (www.buzzardflyingclub.co.uk) I had to report on usage at the AGM. Normal hits on the site is around one or two a week but in the two-week period of the show - first broadcast and repeat - we had over 200 hits. We have seen a number of new members, with membership hitting the 50 mark for the first time in many years. We fly most things at the club. Several new members have started via the 'foam' route, some of which are now building traditional aircraft kits as their experience grows, helped by our knowledgeable members.

Bottom line here is that advertising works!"

Thanks for your message, Ian. And I'm glad that your club's five minutes in the spotlight worked so well. Mention should also be made of the Ivinghoe Soaring Association, whose members were also featured earlier in the same segment.

One thing that did strike me as 'blindingly obvious' was The Buzzards use of a circular mown flying patch, as per some early full-size grass airfields of the 1920s and 30s. Taking off and landing into wind is obviously no problem for these guys, although I guess some care needs to be taken to not fly facing the sun and to avoid overflying any nearby property.

All things considered a circular patch strikes me as a very sensible idea, and one that should be easier to mow, too. Alternatively, mow a large square, as my old chums at St. Albans MAC used to do at a much loved but now lost flying site.

Quite why most clubs appear wedded to long, thin flying strips is a bit of a mystery when you think about it, unless of course there are site restrictions to think about. All models would get off faster and stop quicker facing dead into wind, although I appreciate that larger, faster and heavier machines need a good distance. But if you and your clubmates generally fly conventional size sport and scale models then maybe a circular patch is well worth considering?

Like many of our readers, apart from the lucky few with very large gardens or a big field at the bottom of the garden in which to fly, I have been staying at home and enjoying the predictably fantastic flying weather of recent weeks from the confines of my small back garden.

My inner gardener has been released to a degree, but there's only so much of that green-fingered business that any red bloodied aeromodeller can take, so my shed has been seeing a bit more action than it is used to at this time of year. A new model, albeit an ARTF, has been built and the bench has been cleared to start work on that lovely Infinity Evo glider that I promised to follow up on a few issues ago.

I'm also making good progress on clearing things up in said shed. Indeed, just being able to get through the door and find my building bench is proof of how much conditions have improved! My thoughts have now turned to sorting out my cluttered tool drawers and to the possibility of making up some tool racks and a shadow board. I have received much encouragement in this endeavour from those readers who have been sending in pictures of their own workshops. Seeing so many neat (and some not so neat!) workspaces has inspired me to get cracking on the first of our promised 'In Your Workshop' features, which you will find in this issue. If you've lost control of your own modelling den, just like I had, then I hope this will inspire you to get out there, tidy it up a bit and to start building a model or two whilst the lockdown continues - and beyond!

Happy Modelling!

Kevin Crozier



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The Pitts Special should need no introduction. The prototype first flew in 1944 and went on to become an aviation classic. If you've ever seen one, then you'll know how tiny it is. FMS have emulated the two-seat S2 version but even that spans just 20ft, making this 1.4m span model a respectable 1/4 scale, give or take. *Photo: David Ashby*



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SWITCH ON

WHERE'S BODDO?

Talking about RCM&E's 60th birthday, we were very pleased to receive the following letter from Andrew Boddington, the son of one of the magazine's most popular contributors - and a much-loved past Editor too!

"Hi Kevin,

I thought you would like the following photos to possibly use in RCM&E as part of your 60th Celebrations?

Dad (David Boddington) started to write Single Channel Chatter for RCM&E in the mid-60s using the nom de plume of 'Button Man', as he was already writing for sister magazine AeroModeller and Ron Moulton (Managing Editor at MAP - KC) was concerned there might be too much Boddington! I can remember the hilarity this name caused amongst us children.

Dad continued writing articles and producing plans for RCM&E for many years before becoming Editor in the 1980s."

Thank you so much for your letter and pictures, Andrew. Where would be without the massive contribution that your father, David, made to the magazine over the decades?

Andrew is following on the family tradition, being, as many of you will no doubt be aware, the current Editor of AeroModeller magazine, which is now in its ninth decade. So, we've still got some way to go to beat that!



AIRCOMBAT UK

Timo Starkloff's plan and article for building an easy to make Yak-9 warbird has raised a fair amount of interest, not the least amongst those readers who may be interested in resurrecting Aircombat events here in the UK. Timo put us in contact with David Cowley, who was one of the main protagonists when Aircombat events were regularly held at club flying fields across Britain. David says:

"Unfortunately, Aircombat in the UK all but ended in 2013 due to a lack of pilots. This was unfortunate given previously we had even sent teams into Europe to fly in international events. I would be happy to help others in trying to restart Aircombat but I do not wish to imply that there is an existing network in place just waiting for new pilots to turn up and fly. Anything from here on in would be a grass roots up initiative to gauge interest and arrange something based on numbers interested."

I have already built the Yak and can state it flies very well and is an ideal starter model for IC or electric power. There is no need to modify anything about the design.

Finally, I would state that combat with WW2 fighters is addictive and is guaranteed to improve your flying. It's not easy but is such a rush for the heart and mind."

David can be reached on 07762 591031 if you want to register your interest in helping to restart the Aircombat scene within the UK.

In further emails David sent over more pictures of his aircombat models as inspiration, including one built from Timo's Yak-9 plan and which we used on the cover of the May issue:

Further to my last mail please find attached some images of my build from the Timo Starkloff Yak 9 plan. My only change was to 'pop bottle' mould the engine cowling. It's a super little flyer on an OS15LA engine and budget servos."

"Thanks for the kind comments on my Yak. Many combat models are beautifully built and decorated and were/are much more than just tools. I fly nothing but combat models just as everyday hacks and sports models - here are just a few. The Supermarine Spitfire was from a design by Dave Dempster (the father of UK Aircombat) who recently appeared with a white Nakajima B6N at one of the shows."



FK23 BANTAM SCOUT PLANS

The FK23 Bantam scout was a British built biplane designed in 1918 by Dutch aircraft engineer Fritz Koolhoven. When designed it was the fastest plane in the world, but it never saw service in World War 1.

Using information from the Bleriot library at Old Warden, the Koolhoven Restoration project at Lelystad and his own original photography, long-time UK modeller and magazine contributor Peter Maw has created a five sheet set of plans and a separate graphics sheets for the Bantam, which is to a perfect quarter scale outline.

If Fritz Koolhoven had known about R/C scale models in 1918 he would have designed this plane as a model. The top wing is fixed to the fuselage with one bolt and two dowels, and the bottom wing is attached using two bolts and a dowel positioner. That means no metal bashing as there are no cabane strut mounts. The airfoil shape is the standard RAF R15 undercambered section used on such stalwarts as the deHavilland Tiger Moth.

For its size the wing area is large and the tailplane span is 40% of the wingspan, making the aeroplane super-stable. Wing incidences and angles of attack are as supplied by the Lelystad Aviodrome Museum restoration team, so are proven to work.

A wide track undercarriage makes ground handling really easy on this 75" (1.9 metre) span model. The prototype weighed 14lbs (6.4 kg) and it was covered in Oratex. Power is an OS 120FS engine. The cowl completely conceals the virtually upright motor and cowl, and for dedicated top scale modellers the engine can be completely hidden, whilst electric versions can conceal the complete power system.

The plan and graphics, as well as a comprehensive set of detail shots from the restored Bantam in Holland, are available at: www.FK23Bantam.com

The web site has a comprehensive history section, as well as design and build information to help anyone who decides to build 'the fastest plane in the world in 1918'.

WESTON PARK MODEL AIRSHOW

Steve Bishop, the organiser of one of the UK's most popular model shows at Weston Park in Staffordshire, provides an update on this year's event: "It is with regret that we are postponing Weston Park Model Airshow until October. We have had many discussions with authorities, from the CAA and Weston Park to the World Health Organisation. The health and safety, and the well-being of all that visit our show is, and has always been, our number one priority. We are now planning to run the show on the 16th, 17th and 18th of October. We will post updates on the show website and our Facebook page: www.westonparkmodelairshow.co.uk. In the meantime, please stay safe!"

Get in touch...



kevin.crozier@mytimemedia.com



THE BIRTH OF A LEGEND

In last month's issue, which celebrated the 60th anniversary of RCM&E, Shaun Garrity's article 'The Swinging Sixties' mentioned the market research that had been undertaken prior to the launch of this magazine. This took the form of a questionnaire that was distributed within copies of Aeromodeller and Model Maker magazines, and which eight thousand readers took the trouble to fill in and post back.

Peter Scott is the editor of 'Airscrew', the online newsletter of Northrepps Model Flying Club. In the March issue of Peter's information packed edition is a piece called 'The birth of a legend: Radio Control Models and Electronics'.

Peter writes:

"I was looking through an Aeromodeller magazine from November 1959 and out fell a loose sheet of paper, sixty years old.

It was a flyer for the launch of Radio Control Models & Electronics. And here it is.

There was a questionnaire on the back asking what type of radio-controlled models you use (aircraft, boats, yachts, cars). It also questioned:

- Do you build your own radio or buy ready-made?
- Are you single or multichannel?
- How long have you done modelling and R/C?
- How advanced a flyer are you?
- How old are you?"

Many thanks for this information, Peter. It's interesting to see some of the market research that was performed before RCM&E was launched. We have to admit that the existence of such a flyer was news to us. Thankfully, as we are still here, over 60 years later, it must have generated a pretty positive response!

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TOYER'S TIGER PICTORIAL

'Lord of Scale' Dave Toyer's Tiger Moth even uses some real De Havilland parts!' words & photos » Alex Whittaker





David Toyer's magisterial Tiger Moth is built to 27% scale and spans 95".



The De Havilland Tiger Moth has been celebrated in these pages many times so I will pass over the usual historical sketch. This gives us space for even more pictures of a truly magisterial Tiger Moth model spotted at the Nats.

This superb version was built by Dave Toyer. In traditional modelling circles, BMFA Nats competitor Dave Toyer amounts to royalty. You see, back in the day, Dave was also that tall, fresh-faced young man you saw in all of Boddo's books and RCM&E articles. He is the keen younger modeller in all those evocative black and white photos. In those shots it is energetic Dave who is launching models, building models and generally working alongside Boddington The Great. They were true friends and David actually went on to work for Boddo. He helped develop and build all the classic DB Kits for commercial release.

Until very recently, Dave also worked on full size vintage and classic aircraft. It was therefore natural for him to base his Tiger model on one of the life-size examples on which he had worked at Sywell. David's hugely impressive Tiger Moth is built to 27% scale. She has a wingspan of 95" inches, weighs 12.2 kilos and is powered by a Laser 180 four-stroke glow engine.

PLAN AND DOCUMENTATION

The model and all its scale features are scratch built. David had access to the full-size example and also the Tiger Moth manual, so he was able to draw up his own plan. He also consulted 'full-size' magazines and existing Tiger Moth model plans. David deemed the latter commercial plans inaccurate, so he drew up his own.

Full access was granted to David by the owner of the full-size aircraft. This meant that he was actually able to bring home from Sywell many full-size parts, such as the fuel tank, cowl and spinner to measure and model against.

The wing spars for the model were actually made from an original broken spar from a full-size Tiger Moth!

CONSTRUCTION

The model is of traditional construction using spruce, plywood, balsa and some homemade fibreglass items. The fuselage uses plywood and balsa formers with spruce stringers. The wings have balsa ribs with spruce spars and plywood for local stiffening. The interplane struts locate in scale cups in their wing anchoring positions.



David made the wing from four separate demountable panels.



The tailplane is made up from balsa ribs with special spars and plywood fillets.



The rigging is essential - stainless flat wire with Mick Reeves fork ends.



All the hardwood cabane struts and wires are accurately modelled.

Ailerons are driven like the full-size from a disc on the underside of the wing. David used flat Hitec aileron servos inside the model's wings. Also note that the wing has dummy leading edge slats.

The four wing panels disassemble for travel and storage. David has made up a crutch to hold the panels in position as he fits them to the fuselage at the field.

The tail is built up from balsa ribs, spruce spars and plywood fillets.

RIGGING

The rigging is essential for flight. Stainless flat wire is used throughout. Terminations are Mick Reeves 'fork end' items. The struts end in the scale cups that David made from fibreglass.

ENGINE, EXHAUST, PROPELLER & COWL

Like many Lords of Scale, David went for a Laser 180 four stroke. These are considered ultra-reliable and deliver the sort of power curve suitable for such scale models.

The exhaust is the standard Laser unit and it fits nicely within the Tiger's slim cowl.

He eventually settled on an APC 18" x 8" prop.

David made the front cowl and the fuselage top over the engine by making his own plugs and taking fibreglass mouldings. He also moulded the front bottom 'bowl' of the cowl.



Wherever you look, Toyer's Tiger abounds with authentic detail.



David machined the hubs and moulded his own tyres and DH covers.



Note the specially fabricated latches on the doors.



A Laser 180 four stroke and standard exhaust fits within the home moulded cowl.

“The rigging is essential for flight. Stainless flat wire is used throughout.”



Instruments were based on photographs. Bezels and glasses were handmade.



Note the quite wide track. The side panels on the cowl remove as per original.

The cowl itself opens both sides. The metal panels have the correctly developed and rounded edges and are made from litho sheet. They are held on by scale DZUS fasteners. The piano hinge works exactly as per the full-size and is removable.

UNDERCARRIAGE

David religiously followed the full-size example. He made all the tyres, wheels, covers and legs from scratch.

He made the oleos with direct comparison to the full-size example sitting on his own bench. He machined the hubs and made his own tyres. The latter involved complex wooden wheel plugs, plus female and male silicon moulds, which were necessary to deliver the tyre tread detail.

PAINTING, LEGENDS & DECALS

Local motor factors matched the paint from the actual Tiger Moth panel supplied by David. The paint is a fuel-proof two pack epoxy maroon paint.

The silver paint is totally authentic. It is full-size fuel-proof paint and was sourced directly from the workshops at Sywell airport.

All the ribs and tapes are hand-stitched with a needle and thread - three quarters of an hour for each rib, says David! The scale knots are made so that, like the original, you can't see them!

The model was painted using David's drawn mask artwork, which were then transferred by Flightline Graphics to vinyl masks. The masks on the wings are produced from the full-size owner's artwork.



Non-slip panel on the wing looks suitably weathered. Note the control horns.



Doors, hinges and catches look spot on.



Local motor factors matched two pack epoxy maroon paint from a full-size panel.

Parked out on RAF tarmac, she really does look convincing.



“Apart from the usual Tiger Moth’s slight laziness to aileron input, she has no real vices.”



The Tigger's stance on the tarmac is just right.



Above: Tigger fanciers always look first at the corrugated petrol tank and fittings!

Left: Gracious and distinctive De Havilland rudder.

DATAFILE

Model Name:	Tiger Moth
Manufacturer:	Own design plan
Builder:	David Toyer
Scale:	27%
Span:	95 inches (2.41 m)
Weight:	26.8 lbs (12.2 kg)
Engine:	Laser 180 FS glow
Exhaust:	Laser standard, plus pipe
Prop:	APC 18" x 8"
Covering:	Full size Ceconite fabric
Radio:	Hitec Aurora with five servos

SCALE DETAILS

Cockpit instruments were hand made from exact photographs of instrument faces. All bezels and glass were hand constructed. Compasses were handmade from sections of brass tube. All the cockpit controls quadrants were hand fabricated too. David took the actual quadrants home to measure and photograph them.

Cockpit padding and head buffers were made with blue foam and then covered in the same leather as the seats and the cushions. David used an old leather handbag sourced from a charity shop.

FLYING NOTES

David reports that she flies well with no significant issues. The Laser 180 four stroke and chosen prop are a good match for the airframe. Apart from the usual Tiger Moth's slight laziness to aileron input, she has no real vices. All turns must be coordinated with rudder input. ✈



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FIRST FRIGHT

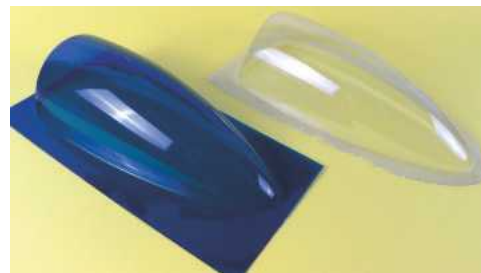
Finally, David Ashby throws his SHK off a hill, fixes an errant rudder hinge, finds the ultimate prop retainer and labels his fleet

words & photos » David Ashby

The SHK has flown. More on the heroic maiden flight in a moment, but when I left you last the wings were complete and I had just the forward fuselage to fit out. This 4m span scale glider kit from aero-naut hasn't been without its 'moments' during construction over the winter, missing parts et al. But I won't dwell on those and, if you've been following progress, you'll already know the story.

CANOPY

Two canopy glazing parts were included with the kit, one clear and the other a light blue shade. The instructions don't refer to the reason and at first, I assumed the blue was a guide blank to help cut the clear moulding. That didn't seem to be the case on closer examination, so I assume the tinted canopy hides the interior a little for those who don't wish to add a pilot. Certainly, I've never seen a full-size version with tinted glass.



Two canopy colours are supplied. Perhaps the blue is to hide an empty office?

*Left: All ready for its first flight.
It was a touch too windy in truth.
Below: It flies, I'm very happy.*



Trimming the piece to fit was easy enough thanks to faint guide marks. A scalpel, car body trimming scissors and a little fine sandpaper were the tools used, while canopy glue attached the glazing to the base in situ. That last point is important as the base is flimsy until the canopy adds strength, yet the cockpit surround's shape must guide the assemblies as the glue adheres. Gluing the canopy to its base on a flat workbench surface might seem fine but a perfect fit might not be the result.

A removable cockpit canopy provides access to the interior and aero-naut supply a spring-loaded canopy latch for the front fixing, with a suggestion that the back is retained with a dowel peg. To be honest I was loath to cut a slot in the forward fuselage (for the latch) but eventually resigned myself to the task and concocted a rear retention method based on a slot on the hatch underside and a 1/4" square cross member in the fuselage. One slips into the other and the canopy goes nowhere.

Pilot wise, I followed the cost effective (cheap) route, so the occupant is a Hangar 9 part, the bod from their RV-4 ARTF. In theory he is 1/3 scale and the SHK is 1/4 scale, but I think he looks fine and about right in situ. Once again, canopy glue did the fixing.



Far left: Front end canopy retention. It seemed a pity to cut that slot.

Left: Rear canopy retention. The fuselage cross member engages in the slot.





The busiest area inside the fuz. To say it's roomy is an understatement!



One of the servo driven air brakes. A little elevator compensation is required to prevent the nose dropping too far when they're deployed.



The tailwheel just protects that tail cone from ground strikes.

NOSE JOB

Balancing was straightforward and around 2lb of lead went into the nose to get the C of G where aero-naut suggest. A glider nose can be an awkward and unergonomic place for those little stick-on weights, so I used the time-honoured method of creating a bespoke moulded lump.

The process starts by wrapping the nose in a protective layer of cling film, then pushing the nose into a bucket of damp sand. This creates an impression for the molten lead that follows. The heavy stuff comes from either lead flashing (cut into little pieces) or, in my case, some lead dummy bullets that I acquired years ago. I melt the lead down in a tin can over a camping stove for which, needless to say, gloves and eye protection are de rigueur, especially when the spitting lead is poured into the sandy recess (I use a long pair of BBQ tongs to hold the can).

After cooling the streamlined lump just needs washing to remove the sand, cleaning up with a file, then retaining in the nose with epoxy. It's best to slightly understate the weight of the lead lump so the C of G can be fine-tuned with the odd stick-on weight when the model flies.

Control surface deflections are suggested in the manual, along with a healthy 50% exponential across those large ruddervators. No mention is made of the spoilers, or their effect on pitch trim, but all my spoiler equipped models drop the nose when they're deployed so I mixed in a little up elevator compensation.

FIRST OUTING

March arrived and the SHK had become a bit of a workbench blocker. I'd long since become tired of staring at the thing and, to be honest, it was difficult to find the motivation to devote more time to the model - fitting a tow release servo and adding a coloured trim scheme were on the 'to do' list but I knew flying it would help with the inertia needed for those tasks. An email from Neil Tricker arrived at around the same time.

"I also built aero-naut's SHK a few years ago and still fly it when the conditions are right. A few points that may be of interest. The tailplane



I seem surprisingly calm. I think 4m is a good span - not too big for transport, but big enough to make an impression in the air.



Flying buddy Lloyd prepares to...



...launch!

A few spots of rain christened it, so the flight was short and photo opportunities limited. A few passes and it was time to land.



“I’d long since become tired of staring at the thing...”



A Hangar 9 pilot sits in there. I know, I know - glider pilots don't wear caps.

incidence, as determined by the tail cone moulding, is now quite right, requiring a degree of up trim. Also, the wing tip washout is over generous (foam wing version) resulting in a frightening gull wing effect if you push on speed on the slope.

As an aside I equipped mine with Graupner's (overpriced) version of the wing retaining system, which also uses the self-engaging, pull back to release air-line connectors. These have a dramatic flaw in that should you catch a wing on landing the strain on the air line connector causes the internal hardened steel balls to bite into the softer metal of the wing attachment, with the result that is impossible to release the wing. I have learnt now to carefully watch the landing and have a junior hacksaw to hand!"

Waiting for the perfect day normally means a very long wait, but a blustery Sunday, with an 18mph south westerly, was hitting the local hill bang on. Which would do; it wasn't warm enough for reliable thermals but sufficiently breezy to provide plenty of slope lift. I packed the car.

All checks were completed but doubts remained. Was my wing building reliable enough or had I added a warp or three with my 'build the wings over an old wardrobe door' technique? Was the C of G close to where it should be and what effect would those spoilers have? I was about to find out.

It was sunny with some dark clouds and a

few little spots of rain hit the wings to christen the model as it left my launcher's hands. It sailed out smoothly, over the edge and went up. Although a few clicks of up elevator trim were required it was predictable, although a little sluggish in pitch and roll. I had prepared for the flight with the 50% exponential suggested, but it was clear this was a bit too much.

I made a few passes and we grabbed a few snaps before a very dark cloud and more moisture forced a landing. Testing the spoilers first, I found that my suck-it-and-see elevator compensation was about right; the nose pitched down a fraction, but nothing that couldn't be held on elevator for the gentle arrival that followed.

There's plenty to do, more trimming flights await, but at this stage I'm very happy. Mrs A's sewing machine has helped to create some wing bags and I'll add the final embellishments before longer, warmer days arrive.

SCHWING FIN FIX

It wasn't my best, but not a heavy landing by any standard. But it was obvious that something wasn't right as I approached to retrieve the model. The rudder had come away - darn!

Aeroic's Schwing is a 2.2m span sport



Rudder hinge repair kit for moulded gliders.

aerobatic glider that's become my slope hack over the last few years. I acquired it second-hand and have grown to love it. It'll fly in surprisingly calmer conditions, perhaps a 10mph breeze, but with ballast it zips around like a fighter jet when the wind gets up. In fact, the ballast slugs never come out of my model - they've probably rusted in place by now!

The previous owner built it carefully, but it's a well flown model these days with the usual nicks and scratches. Back to the rudder; moulded gliders tend to use a hinge made from thin fibre glass matting. It's usually a pretty strong method, although I'd seen other Schwings with hinge repairs where similar problems had occurred, and now it was my turn. The trouble with thin matting is that a small tear can quickly become a larger tear, with





One tear is all it needs, and the rest of the hinge will eventually do the same until this happens.



Aquarium sealant is applied around the joint, the joint is taped and the sealant spread over the weave from the inside.



Job done. The tape could be removed but it doesn't look so bad, so I've left it there.

“...with ballast it zips around like a fighter jet when the wind gets up. In fact, the ballast slugs never come out of my model - they've probably rusted in place by now!”



A Brother P-touch machine has labelled my hangar. Have you done yours? If not, why not?

the bumps and knocks dealt out by hill terrain having a cumulative effect.

There are a couple of popular fixing methods. Some just re-hinge the rudder using tape and consider the job done. That's ok, and there are some good tapes around these days that'll do a decent job. But I wanted a more permanent solution, which meant a trip to the local pet shop.

I was after a tube of aquarium sealant, the stuff my hill flying buddies said I needed. It acts as a flexible joiner twixt rudder and fin. Basically, here's what you do:

1. Apply sealant to both rudder and fin edges.
2. Re-fix the rudder using hinge tape.
3. From the other side, work the sealant across the join and into the weave, applying more sealant if needed while ensuring the hinge wiper remains sealant free.

That last point is important as sealant sitting on the surface won't stay put for long. The wiper is the curved hinge seal that forms the other side of the rudder's leading edge. It ensures a gap-free control surface and is, obviously, something the sealant mustn't

touch. I left the hinge tape in place too, just to be on the safe side and the fix has survived several flights so far.

BAND AID

The indoor flying season has come to the end and we've had a lot of fun. Although there were 'moments', my shockie, a Multiplex Challenger, has miraculously come through to the end in one piece, although I've lost count of the O-ring prop retainers I've gone through. They just seem to perish and break so easily. A friend put me on to an alternative in the form of silicone bands that seem practically unbreakable by comparison, if the one he gave me is anything to go by. You can find them on eBay. Highly recommended.

NUMBER TIME

Incidentally, like most shockies, I assumed the Challenger was light enough to be within the CAA's 250g limit. Then I weighed it and now there's an operator number on the fin as it's a smidgeon over the limit and sometimes gets flown outside in the summer.

I bumped into a pal on the hill recently who said he didn't think he needed to label his models, but he's wrong. Indoor models

don't require an operator number but if you've not labelled your other >250g models then you need to now.

I bought a Brother P-touch H108 handheld printer for the task. It's about £30 and chugs out a ticker tape at the touch of a button. Tape types vary but all come in cassettes that can be swapped out mid-use. The laminated waterproof type is the one to go for and aftermarket refills are cheap. Ignorance or petulance are no excuse so just get 'em done, then get out and enjoy your summer flying. ✈️



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WUNBESIX

A tailless electric powered sports model with an easy to build Jedelsky wing, designed by Mike White.

words » Mike White
words & photos » Mike White,
Lindsay Todd, Kevin White



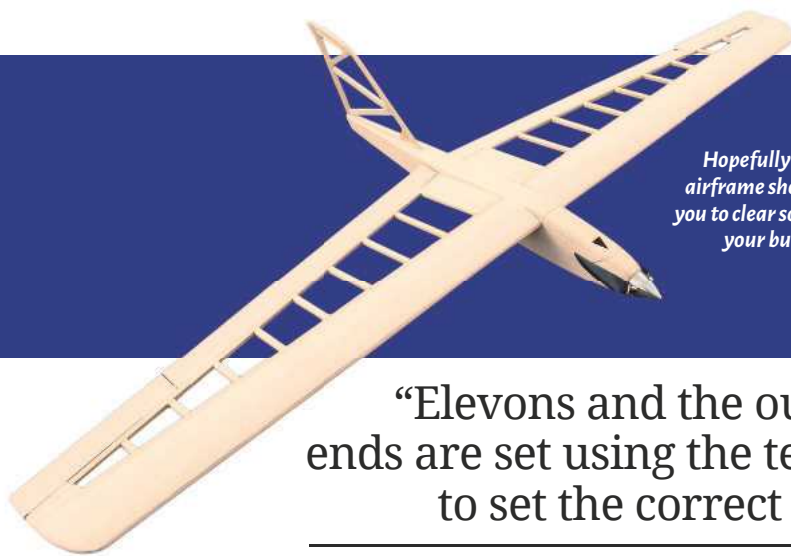
This wing type may seem a little crude to some, but the airfoil used here is simple and quick to build, does not come out overweight and is sufficiently efficient for a sport model. The fact that the tailless wing planform is unusual should not put one off building it as it is a surprisingly good performer.

The power recommended is small, so will not be costly, but the turn of speed is surprisingly high, giving the model a moderate climb performance and good slow glide. And, although it was not designed for aerobatics, it will easily loop and roll gently. Rolling, though, does need a lot of down, as the model becomes inverted, and the rolls are large and 'barrelly', so one needs a lot of height and some practice.

Perhaps a good description for the model would be to say that it is suitable for large park flying for someone with a little experience in building and flying. The wing build is probably the easiest you have ever suffered! Controls are by elevons only. My model is powered by an economy motor, a D2836-7 (1120 kV), a 40-amp ESC (as I had it in stock, although a 25A item



Mike displays the compact form of this relaxing tailless sports model.



Hopefully this finished airframe shot will tempt you to clear some space on your building board.

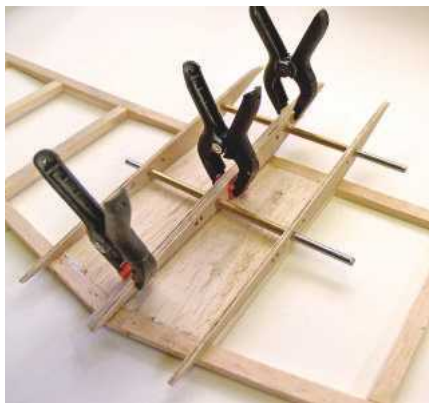
“Elevons and the outboard ends are set using the template to set the correct reflex.”

would suffice) and a 2S-1800, 30C LiPo battery with an 11 x 6 folder prop. This combination draws 15 amps (120 watts total or 60 watts per pound) at full throttle and the ready to fly weight came to 33 ounces. A more powerful motor would be possible, say one with a load of about 100 watts per pound, but I do not see an advantage to this as the Jedelsky airfoil will be the limiting factor on flight performance.

JEDELSKY FIRST

As the build is a little unusual some notes may help. The wing build starts first with the 3/8 x 1/4 medium weight balsa strip frame, with the cross pieces glued, drilled and pinned with wood cocktail sticks cyano-ed in place. Build the other wing frame on top of this, separated by pieces of cello tape at each joint to prevent the two sticking together. While these items are setting select the sheet for the solid forward part of the wing from light balsa, (not contest grade). Mine weighed in at 100 grams, or 3.5 ounces each in real money. I get my balsa from Balsa Cabin, who can provide you with the correct grade of wood for this item. Mark out as shown on the plan and plane down to the lines, finally rounding off with sandpaper. Add and shape the hard balsa leading edge. 100% accuracy is not necessary, but it might help! A note on R1's and 2's. Cut out one R1, mark it and use as the master rib to cut both R1's and R2's. Cut three blanks and tape all four together and then, using a drill press, drill two holes for the joiner tubes and two for the 2mm bolts with which all four items are secured together. If you do not have a press, make them up in pairs and use a hand drill. In two R1 ribs, cut two holes for the magnets and two tight fitting holes for the servo female plugs. Make up two F4's and use the R1 master rib to mark the joiner tube positions and lay off to one side. Pin down the open framework of one wing and to it glue an R1, ensuring that it is at 90 degrees. Place the other wing panel abutting the first, with its R1 in place, and then clamp the two together with the joiner tubes unglued and the joiner rods in place. Glue the R2's, insert the tubes, adjusting their positions as necessary and use a straight edge (as in the nearby picture) so that they align with it and are parallel with the front edge of the framework. You are now looking at the bottom surface of the wing. See images of this

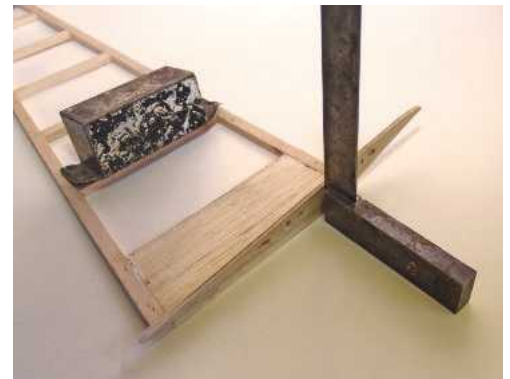
operation. Glue on the forward sheet after planing one edge to ensuring a good join and prop up to the correct angle while it sets, taking the angle formed by the R1, R2 ribs as correct. Finally, drill and insert wood cocktail sticks near each cross-piece and add a drop of cyano. Elevons and the fixed outboard ends are set using the template on the plans to set the correct reflex. Fit all other wood parts as necessary.



R1 and R2 ribs in place together with tubing and wire joiners.



Wing frame showing wood toothpicks cyano-ed in place.



Rib R1 being set up.



Fuselage side with nose doubler. R1 being used to mark tube positions.



Both sets of R1's and R2's as yet unglued and waiting for final assembly. Note holes for magnets and servo lead female sockets cut out in R1s only.

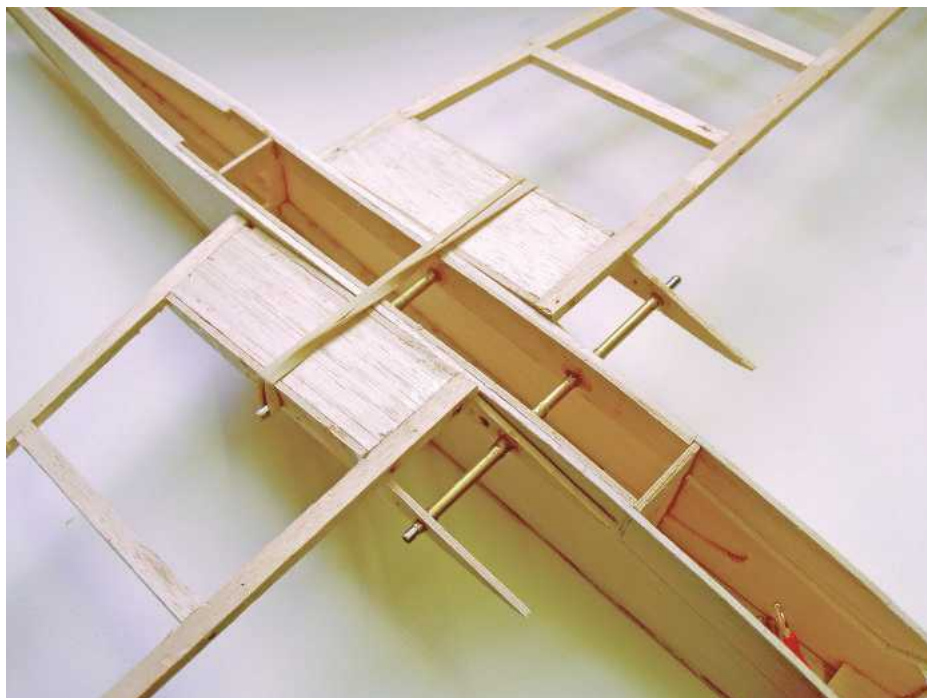
Fuselage view showing major internal components.



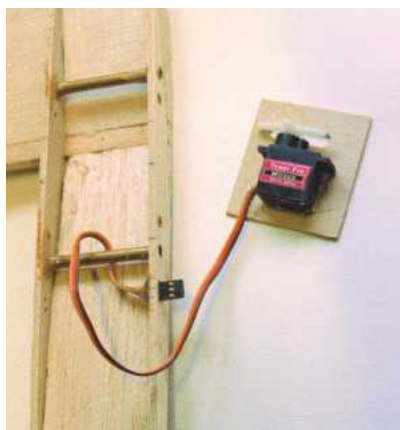
BODY WORK

Fuselage construction is from medium sheet balsa and is fairly simple, but some points should be covered with respect to the fitting of the joiner wires to ensure that the wings fit snugly against the fuselage sides.

When the fuselage sides have been cut and the balsa doubler at the nose has been glued, fit and glue F4 and mark the holes for the joiner tubes using an R1 as a guide. When the fuselage box has been finished, with the exception of the top sheeting, dry fit the joiner tubes and the R1 ribs using the incidence template to check the correct incidence. This is shown on one of the images. Fit the wings and, if necessary, adjust the position of the wire holes on one side only until both wings sit snugly. When satisfied epoxy the tubes, but not the wires as these may then be removed for transporting, if needed. Wings are secured to the fuselage by 10mm magnets epoxied in place, then cover them with whatever covering you use to prevent them being lost if they break out. As a note you will need 12 magnets, four for each wing panel and four for the canopy. I have not shown any motor down thrust on the plan because I mix throttle-elevator to trim my models for throttle changes. To do this first trim the model for the best glide you can get on the digital trims and then reset them at the mechanical horns. Reset the digital trims to neutral and proceed as for your particular transmitter. If the builder prefers to set some down thrust, I would suggest about two degrees.



Setting up joiner tubes and joiners. Use the template to accurately set the incidence.



Right: Setting the servo plug. The servo is glued later to 1/16 ply.

Below: Complete motor and prop assembly in place and showing motor cooling inlet. Rubber bands around the blades ensure they fold completely against the fuselage sides. Replace frequently.



Receiver plugs epoxied in place.



Front end before planing and sanding to shape.



AN ELECTRIC POWERED SPORT MODEL
WITH MILD AEROBATIC CAPABILITY

WUNBESIX

DESIGNED BY MIKE WHITE



1/4" x 1 1/2" Balsa
Sheet Elevons

1/8" Light Balsa Fuselage Sides

1/8" Sheet

1/2" x 1/4" Balsa Fin

Magnet

1/2" Triangle

OUT OUT

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6SWG BRASS TUBES

1/8" LIGHT SHEET

1/4" Balsa Sheet

3/8" x 1/4" MEDIUM
Balsa Aft Frame
1/8" Light Balsa Fuselage Sides to A

RX LOCATION

T.E. STOCK

MAIN

FIN

INCIDENCE TEMPLATE

ALIGN WITH F

1/8" Ply Wing

Joiner Tube Plates

1/8" Ply Wing

Joiner Tube Plates

1/8" Ply Wing

Joiner Tube Plates

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1/8" Ply Wing

Joiner Tube Plates

1/8" Balsa Canopy
Retained with Magnets

1/8" Balsa Sheet
Doubblers

1/2" Triangle Balsa
to Allow Nose Shaping

6SWG Piano Wire
Wing Joiners in
Brass Tubes

1/4" x 1/8" Balsa
Lower Longerons

Elevator Up & Down
Rates On Rates Off

AILERON/ELEVATOR MOVEMENT TEMPLATES
SUGGESTED START POINTS
MEASURE AT CONTROL HORNS
SUGGESTED 40% EXPONENTIAL

1/8" Liteply
Formers

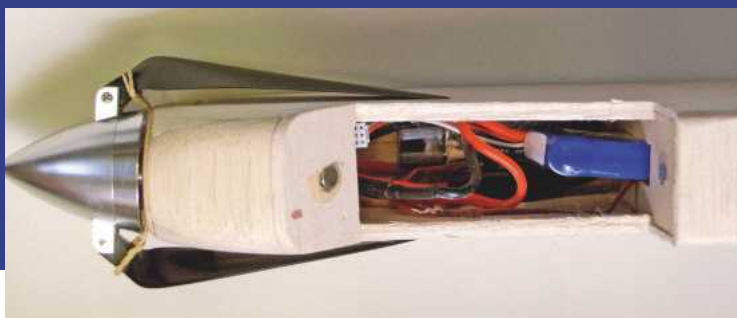
SPAN
WEIG
WT



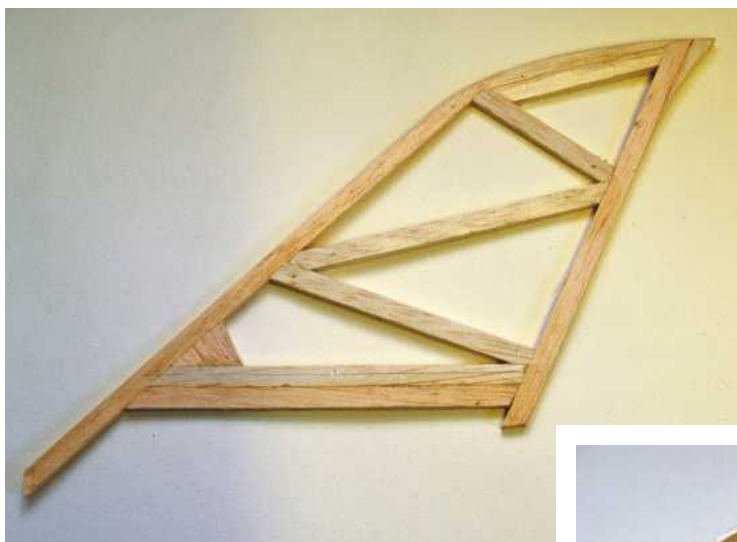
Battery cooling air outlet forward of F3. Note receiver bind light is visible - this also provides access for the receiver (using tweezers).

FINISHING TOUCHES

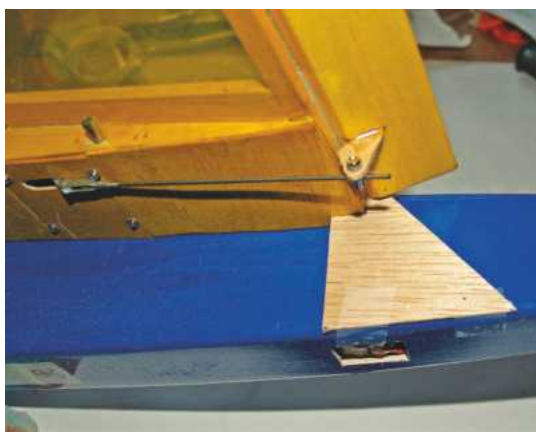
The receiver is mounted in front of F3 by fitting it through the rear cooling vent in the fuselage bottom so that the bind light is visible. If necessary, the receiver may be taken out by gently using tweezers or long nose pliers. The elevator servo wire male sockets, from the receiver, are epoxied into holes in the fuselage sides with their ends flush with the outer face of the sides. With the servos in place in the wing slide the wings onto the joiner wires and connect the servo wires into the receiver sockets already glued into the fuselage. You may find that the servo connections are a very tight fit and if so, lightly sandpaper the female until they fit smoothly. Push the wings into place, so they are secured by the magnets, and epoxy the servo wire plugs into the root R1s. A template will be found on the plan for setting elevator reflex and all control surface movements as starting points. Some exponential could be set, and, on my model, I use 45% to soften the responses around neutral. Balance range is quite small and should be set accurately with a forward position - important this, for the first flights, until you have the trims set to your liking. Even a little bit more forward than that shown on the plan will do no harm. Balancing on the fingers may not be accurate enough but if you mark the balance range on the fuselage bottom and then place the marked area on a 3/8 dowel this will give an accurate balance. It would also be best to get a flying buddy to do the first launches for you until you are confident that the trims are to your liking.



View under canopy. Battery position shown here gives a mid-range balance.



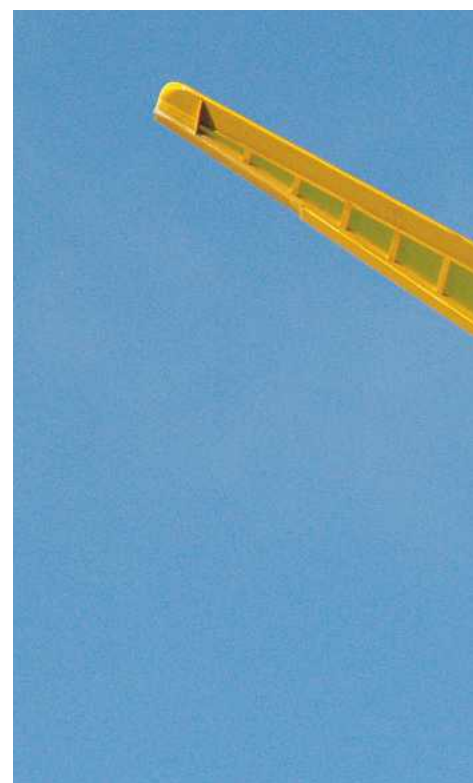
**Above: Fin framed up.
Right: Canopy under construction.**



Incidence template in use.



Elevator servos are epoxied to 1/16" ply covers and screwed into hardpoints.





Resist the temptation to fit a more powerful motor as the Jedelsky airfoil will be the limiting factor on flight performance.



The tailless wing planform is unusual. Wunbesix is a surprisingly good performer.



Ready to go – when the weather clears!

“Balance range is quite small and should be set accurately with a forward position.”



This model will be most enjoyed by modellers with a little experience in building and flying.

DATAFILE

Name:	Wunbesix
Model type:	Sports electric
Designed by:	Mike White
Wingspan:	1.85m (73")
Wing area:	1298mm (51")
All-up weight:	3500g (7.7lbs)
Wing area:	605 sq.in.
All-up weight:	0.9kg (2lbs)
Power:	D2836/8 1100kV, 25A ESC, 11 x 6 folding prop
Rec'd LiPo:	2S 1800mAh
ESC:	25 - 40A
Servos:	2

FIRST FLIGHTS

My flying buddy, Peter Lloyd-Davis, does the first launches for me with a new model and on this occasion all went well, with a clean launch at a nice easy speed and climb rate, even though the wind speed was about 20 mph and there was a lot of chop in the air. Trims were adjusted as necessary and surprisingly quickly the model was set up for some circuits and then at height to check out the glide performance, which was surprisingly good.

Rolls and loops have been discussed in the preamble so I will leave you with the hope that you enjoy your Wunbesix and the gentle flying that you will have with it. Should you have any questions regarding the build or the flying of the Wunbesix please e-mail me at: mandjwhite@manx.net

NAME CHECK

Wunbesix? 1 x 6 - IT'S A PLAAAANK!! (With apologies to Brian Conley.) ✈

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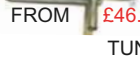
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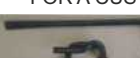
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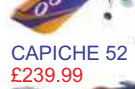
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TRIMMING FOR AEROBATICS

Top competition pilot, Keith Jackson sets about keeping us better informed of developments with pattern style model aircraft

words » Keith Jackson | words & photos » Keith Jackson, Robin Trump, Tom Doyle, Bryan Hebert, Chris Bond, Adrian Mansell

When the competition season eventually gets started, I'm guessing most pilots will want to try out their new models and some will come to the immediate conclusion that said model is the best they have ever flown. Fast forward a few flying sessions and, as is often the case, the new model is now found to be not quite as perfect as the original session would have had us believe.

Flying aerobatic schedules is, in my opinion, the best way to re-assess the original belief as the demands of the various manoeuvres soon start to show deficiencies in the model's design and setup. Even some of the best modern sport models exhibit a degree of control coupling that can make some manoeuvres difficult to perform. This is perhaps most true where large deflections of rudder control are required, for example in rolling loops or knife edge flight. This then requires the pilot to combat these effects (e.g. adverse roll, where the model rolls opposite to the applied rudder, by applying more roll control than is normally required). Another example is when the model pitches up or down when rudder is applied, and this is very visible during point roll manoeuvres,

resulting in the model heading off track. Trying to second guess how much elevator to compensate this effect would stretch the best pilot's abilities.

Rudder induced roll and pitch results from several factors relating to the model design, which include:

- **Dihedral.** This occurs after the model yaws when rudder is applied. As the model yaws the forward most wing panel will present a higher incidence than the other, allowing it to generate more lift and causing the model to roll. For example, if right rudder is applied, the model yaws to the right, causing more lift to be generated by the left-wing panel, resulting in a roll to the right. This is how models used to be controlled in the early days of radio control where only rudder or rudder/elevator controls were available. Generally, the more positive dihedral the model has the more likely it is to roll in the direction that the rudder is being applied, i.e. left rudder, left roll.
- **Centre of Gravity.** Most modern F3a models have a fairly rearward C of G to achieve neutral longitudinal stability. However, pitching with rudder input often occurs and

may require the C of G to be repositioned away from this optimum position.

- **Fuselage/Rudder/Fin Geometry.** i.e. the amount of structure above or below the fuselage centre line.

The net coupling in a model is a combination of all these factors, plus some other speed dependant effects such as drag from wheel spats, canalsers etc., which is why trimming can be complex; you address one issue and it might not cure the model, meaning other issues are also present. I think Ken Binks once referred to this as being like squeezing a balloon one way, only for it to pop out somewhere else!

IRONING OUT TRIM

Fortunately, there are two ways of combating trim problems. Firstly, by altering the structure and trim setup of the model, and secondly using the electronic mixing found in most computer radios. By far the best description of how to modify and trim your model is given on Brian Hebert's website (www.ckaero.net/blog/triangulation-trimming-2) so there's little point me trying to reproduce it here. I recommend anyone with a serious interest in getting the most



Left: Adrian Mansell and his highly symmetrical Lepton design. Even the canalyser and airbrakes are symmetric! Flies wonderfully - though using the correct transmitter mode (1) helps.

Below: Model fuselage profiles can be altered to reduce control coupling with the addition of foam plates like on the rear of this BJ Craft Element.

Below left: The rear fuselage of the RT Karat has been deepened with foam plates.



out of your model to visit his site and carefully read through his trimming method. In addition, there are also some very reader friendly descriptions of model setup and trimming at:

- www.wikihow.com/Get-the-Best-from-Your-Model-Plane
- www.fieldofdreamsrc.com/uploads/1/0/5/0/105036995/trim_chart.pdf

Years ago, and following an issue with roll coupling with rudder, the amount of dihedral was altered by literally sawing the wing in half at the root, adjusting the dihedral angle and then re-glassing the joint. This process was repeated until the roll coupling was reduced to a minimum. These days, with most F3a models having two-piece wings, this is not so easy to achieve. In addition, the relative height of the wing against the fuselage can also be altered by moving the wing seat or wing tube position to prevent coupling, though this is quite an involved modification.

Fuselage structural alterations can be tested by the addition of foam plates on the top or bottom of the fuselage. The BJ Craft Element, whilst already a great design can be

improved slightly by extending the fuselage area beneath the stabiliser as shown in the picture nearby, the aim being to extend the fin surface below the fuselage centre line.

MIX IT UP

Most modern F3a designs are fairly mature and consequently require little if any structural alterations. Fine tuning of the model's response can then be achieved using electronic mixing, available now on most radio systems. Typical electronic mixes used these days relate to rolling and pitching effects when rudder is applied. A common issue is rolling with (proverse roll) or against (adverse roll) the applied rudder, i.e. if you input left rudder, the model rolls left (or right). Additionally, the model is also likely to pitch up or down with rudder input. This may



Screen shot of Rudder to Aileron mix.

be one reason why your slow or four-point rolls go adrift, so it would be great to apply a mix to counteract these deleterious effects. The most common mixes are:

MASTER	SLAVE	REASON
1. Rudder	Aileron	Model rolls with rudder input
2. Rudder	Elevator	Model pitches up or down with rudder input
3. Throttle	Elevator	Model pitches in vertical manoeuvres
4. Throttle	Aileron	Model rolls with engine speed, opposite to propeller direction





Screen shot of Rudder to Elevator mix.



A more extreme version of Rudder to Elevator mix in my BJ Craft Agenda, clearly showing non-linear control requirements.

Most computer radios now feature several functions designed to help the pilot implement these mixes and these can vary from simple linear rate type mixes, e.g. those which apply, say, 5% aileron with 100% rudder stick throw, to complex response functions which might be logarithmic, two-step or multi-point curves, as found in the Futaba MZ radios. The latter systems may sound overly complicated but can be of real help when simple mixes don't iron out all the problems.

Other examples of where high rudder input is used is in the descending part of the rolling loop or in the Knife Edge Top Hat, and here large rudder deflections may cause non-linear yaw-roll / yaw-pitch coupling, meaning that simple linear mixes may not be enough to obtain the degree of aileron correction required. This means that at the most stressful part of this manoeuvre the model suddenly rolls unpredictably in a manner that could cause a poor score at best or an accident at worst. Unfortunately, the cost of radios with this kind of functionality is high but ultimately you do get what you pay for.

REACTING TO RUDDER

To determine the correct mix required to compensate for rolling or pitching with rudder, start off trying to fly knife edge in a straight line into or downwind by holding just rudder control. It is imperative you give the model a chance to settle and hold a line whilst doing this, so plan for at least 100m of knife edge flight. The model will almost certainly pitch and roll at the same time, so the pilot or helper needs to remember which way the model goes. Then apply small amounts of opposite control via the rudder-elevator or rudder-aileron program mixes. I tend to address the rudder-aileron issue to begin with as the model has less chance of going into a scary dive during the knife edge. Repeat the knife-edge pass and correct further until the model flies a pure knife edge, i.e. without any other effects. Then fly the opposite knife edge and repeat the process until the model can fly both left and right rudder knife edges without any major issues.

Applying these mixes can be a painstakingly long process, requiring a very critical approach by the pilot to be ultimately successful. However, there really isn't any point trying to fly schedules if your model is not trimmed correctly, as all you're doing is fighting adverse characteristics.

The amount of mix required will also vary with the speed of the model and throttle setting. Again, these effects are generally non-linear, so the trick is to vary the amount of mix as a function of the rudder control input. That is, at slow speeds where more rudder is required to hold knife edge, you would need a different amount of mix compared to when the model is flying fast and little rudder is used to hold knife edge flight. At the end of this process you should be able to comfortably hold knife edge flight in both directions.

HOW MUCH?

If very large amounts of correction are required it might be necessary to revisit the aerodynamic fixes mentioned in Bryan's website before trying to apply further electronic mixes. However, don't get too hung up on the absolute percentage mix you need as this depends strongly on how much or how little control throw you have available. For example, if you only have +/- 10 degrees of elevator movement then a 20% rudder to elevator mix will move the elevator surface much less than if its overall movement is +/- 30 degrees. If, however, you already have a lot of overall control throw and you find the control mix required to stop rolling or pitching with rudder is large then you may be chasing a lost cause - not all models will be fixed using electronic mixes, e.g. the Wright Flyer!

THE RIGHT BALANCE

Backtracking a little here, the correct approach to these trimming issues is to ensure the model geometry and setup is correct to begin with. Again, this has been dealt with umpteen times previously, so I won't go into too much detail here. The Centre of Gravity is a little tricky as there is

often conflict between what the model designer specifies and what the pilot is comfortable flying. Generally, a more forward C of G allows the model to be more stable, particularly in wind conditions, up to a limit where the model begins to respond sluggishly. An example of this is the BJ Craft Element which was developed with input from US pilot Andrew Jesky. The advocated balance point was the rear edge of the wing tube, and certainly this has worked for a lot of pilots. However, other pilots, including myself, have flown very successfully with slightly more wing incidence and a more forward C of G positioned at the front of the wing tube. The answer to this conundrum is that you adopt the setup which suits you as a pilot and that includes C of G position.

There are several methods to check the C of G after the initial setup and trim of the model is established, and these include:

1. Fly the model vertically down. If the model pulls to the canopy, then the C of G may be too far forward. If the model pulls to the belly, then the C of G is too far rearward.
2. Fly a 45-degree climb and roll to inverted. Ideally the model should gradually sink from the initial line. If the model immediately drops, then the C of G is too far forward. If the model climbs beyond the 45-degree line with no elevator input the C of G is too far rearward.
3. Fly the model in knife edge at cruise speed and then move the throttle to idle. Ideally the model should maintain its flight attitude but begin to drop slowly. If the nose pitches down, then the model is nose heavy. If it pitches up, then it is tail heavy.
4. If the model is unpredictable in wind, or will not hold a straight horizontal line, the C of G may be too far rearward. N.B. check the control throws are not too large!

All these issues are addressed in Bryan Hebert's trimming chart as is the correct order in which to proceed.



Screen shot of a typical throttle to elevator mix.

Returning to the electronic mixes mentioned above, if the model still pulls to the canopy in a vertical dive, it is worth applying the throttle to elevator mix. This should be set to activate on the lowest throttle position only, i.e. the last click of low throttle. The amount of elevator in the mix is often small and should be just enough to keep the model in a true vertical descent. Too much elevator and it will start to affect other parts of manoeuvres such as descending 45-degree lines when power is off (e.g. in cobra rolls or 45-degree lines with rolls or snap rolls).

The picture nearby shows a typical arrangement for Throttle to Elevator mix. With the stick in the lowest position (-100%) the mix is introducing 3% elevator control and is flat for the rest of the throttle stick position.

TORQUE EFFECTS

The final mix to consider is the throttle to aileron mix, which is introduced to counter the effects of torque from the engine or motor inducing a roll opposite to the propeller direction. Its biggest presence is when the torque of the motor is suddenly increased when powering up from idle, for example when pulling out of a square loop. In this case model speed is low and when power is applied the large torque reaction causes a partial roll and sends the model off heading. In practice few models I've flown exhibit this behaviour significantly and contra driven models clearly even less so. This can be assessed by flying the model straight and level at different throttle settings such as normal cruise speed, full throttle and then reducing power to idle, all the time watching for any roll tendencies.

ELEVATOR ALIGNMENT METHOD

If your model includes separate elevators, as most designs do, the trim and control throw of each surface should match exactly throughout the entire range of movement. Failure to do this may cause the model to roll slightly every time the elevator is applied, causing the tracking throughout



Ideal control linkage arrangement.



Typical control deflection gauge.

the schedule to suffer. It is often assumed that the control throw for each elevator is identical given that the two servos employed are often the same make and model. However, each and every servo is slightly different, and this will be reflected in the final movement of each elevator surface.

The actual movement of each servo can be measured externally using a protractor to measure its rotation for a given control stick position. Once installed in the model, careful matching of the linkages and horns should result in equal amounts of throw for each elevator. For this to happen you should always check:

- Each servo output horn is exactly at ninety degrees to the linkage.
- Each linkage is exactly the same length.
- Each control horn is fixed to each elevator surface identically.
- Control rod to surface control horn joint is directly above the elevator hinge line.



Elevator alignment using carbon rods.



Elevator alignment at neutral.



Elevator alignment at full up elevator.



Elevator alignment at full down elevator.





BJ Craft Fantasista 70 alongside my Pegasus models Excess.



Fantasista 70 from the front. Uses an APC 16 x 12 propeller and Falcon vented spinner.



Fantasista 70 from the rear showing its sleek lines.

“The model utilises an all moving tailplane. Don’t be worried about this, it is absolutely great!”

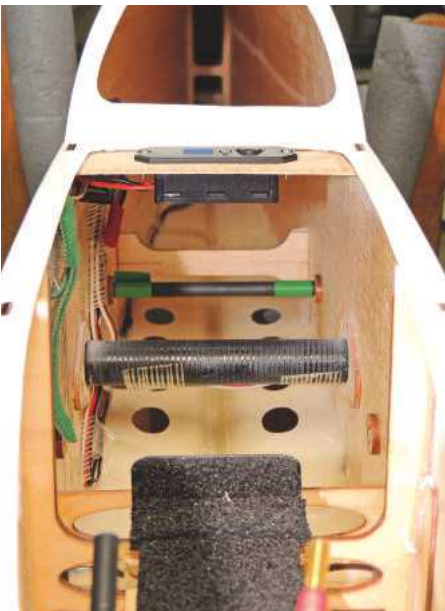
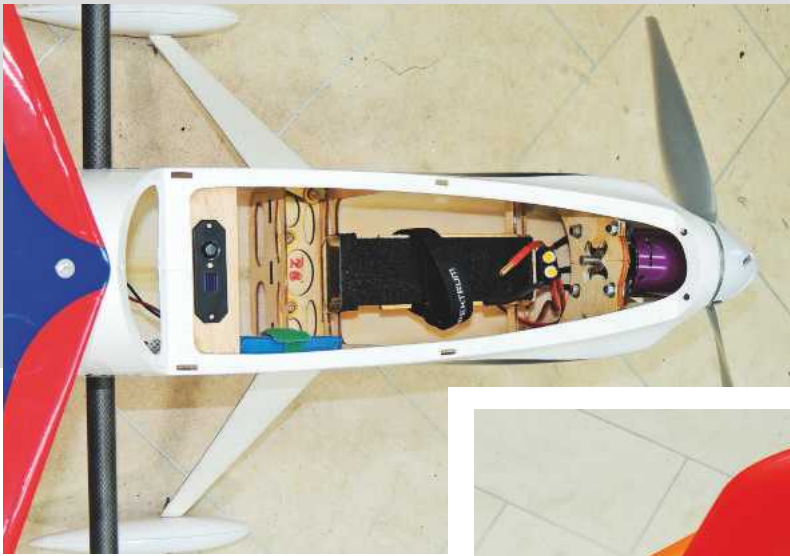
The final elevator surface movement can be measured using deflection gauges, which show the angle through which each surface is moving. These devices are available from various manufacturers such as HobbyKing, TopModel, GreatPlanes etc. Alternatively, there are several videos online which show how they can be made from various household items.

A different method of checking for identical elevator control throw is to use some 2 mm diameter carbon rod taped to each elevator, as shown in the picture. A third length of carbon rod is then balanced on the two rods at exactly the same distance from the elevator trailing edge and held loosely in place with some cotton thread. The trim of each elevator can be confirmed by looking from the rear of the model and visually aligning the third rod against the line of the tailplane or other horizontal feature on the model such as the canopy. Assuming points 1-4 above have been checked, each elevator can then be adjusted with small amounts of sub-trim. To check whether the servos and linkages etc allow an equal response for a given elevator stick position, the levelness of the third rod can be assessed for all elevator stick positions. Clearly if it is not level then the elevators are not moving identically and the ATV function for each servo should be adjusted accordingly. If your transmitter has a servo throw checking function, then this can be used to cycle the elevators through their operating range and any unequal movement will soon become apparent. A commercial version of this system is available from CK Aeros website at www.ckaero.net/tools.php.

BJ CRAFT FANTASISTA 70

I have now completed the build of the Fantasista 70 and have included some pictures of the finished model. The model has a wingspan of 1520 mm and the fuselage is 1630 mm long, with typical BJ Craft construction featuring a balsa/glass composite fuselage and built up wings and tailplanes, which are film covered to a very high standard.

The model utilises an all moving tailplane. Don't be worried about this, it is absolutely



Above: Rudder linkage from the Futaba BLS 173 SV servo. All moving tailplane bearing tube is also visible.

Top left: Hacker A50-16 mounted in motor bay. ESC mounted in direct airflow for best cooling.

Far left: Interior of rear fuselage. Typical BJ Craft balsa glass construction. PowerBox Smartswitch used for HV power to the airborne R/C.

Left: Elevator linkage to the all moving tailplane. Very simple, very effective!

great! It is simple and robust, saves you an extra servo and the tailplanes are always aligned. In flight it just feels like a normal elevator response with its own natural exponential around centre.

I chose to use Optipower 4300mAh 6S 30C LiPo packs weighing 630g to power a Hacker A50-16 motor, which turns an APC 16 x 12 propeller at 7100 rpm. This gives a flight time of approximately 10 minutes, leaving 25% of the pack remaining.

All up weight, including flight batteries and a separate 850mAh 2S pack for airborne radio, came to be 3063g. For motor control I used a Hacker MasterSPIN 75A Pro OPTO ESC.

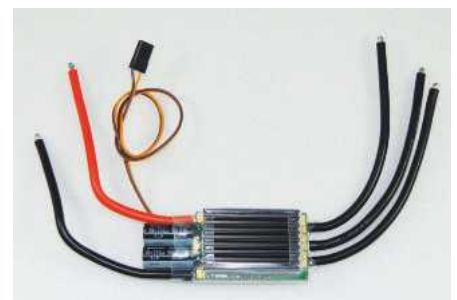
For control of the flying surfaces I used Futaba BLS 173 HV servos for rudder and ailerons, and a Futaba S9170 SV servo for the all moving tailplane.

The model is very neutral in flight and so far, does not require any significant mixing, though it is early days. Power is enough for an almost continuous vertical climb and the MasterSpin ESC will allow fine tuning of the braking function to slow the downlines. Rolls are very axial, and snaps simply have to be tamed; they are blisteringly fast! All in all, a wonderful model and ideal for entry into F3a flying, which should serve the pilot all the way from Clubman to Master class.

ADAM DEBOWSKI D3 ESC

This is a compact lightweight speed controller for up to 10S packs and capable of handling up to 120A. The fact that it is nearly 20g lighter than the lightest speed controller I have encountered, (the Jeti Spin 99 Opto with alloy heatsink only weighed 91g!) is not the unique selling point of this controller. According to the designer, Adam Debowski, it is actually capable of precise motor speed control according to throttle stick position and is supplied with a calibration to suit the user's motor, such as the Hacker Q80, Plettenburg Advance, Kontronik Pyro 650-53 used in the Adverun or the 650-78 used in the Akiba drive.

The ESC will adjust power and braking function automatically to maintain the set motor speed regardless of the attitude of the model. So, this means the typical wind up of motor speed you hear when a model descends a long vertical leg won't now happen and the model's speed will be much more accurately controlled by the ESC and pilot. This feature is available across the entire motor speed range rather than just the simple brake function found on most ESC's, which only operates at the motor-off condition. This is the same principal of control used by the Hacker Sensotrol ESC but at a much lower price. ✈



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TOTALLY SCALE AT OLD WARREN

Whittaker visits this mythical area of England for the famous Shuttleworth scale bash.

words & photos » Alex Whittaker

What can be said about the magical Old Warden and its Shuttleworth Collection that has not been said before? It is unique. It is quintessentially English. It is delightfully unexpected. Every time I visit Old Warden, I have to pinch myself that it actually exists. The village and the surrounding estate are set in the deepest English countryside. Old Warden possess a timelessness which is hard to describe. It always astounds me to think that the mighty workaday A1 thunders north and south just a mile or two away. Somehow that should not be allowed. We aeromodellers don't want the contagion of modern life to contaminate our mid-summer night's dream that is Old Warden.

A FINE EXPERIENCE

Visit on a high summer's day and you step back to kinder age. I love the small Old Warden traditions, like the impromptu car park 'luncheon brigade'. Whilst the rest of us are on the burgers and beer, these refined 'aeromodellists' (so the sign says) set a higher tone. Gracious Jaguar car boots disgorge Fortnum & Mason picnic baskets onto the green grass. As diesel powered

Early start for the scale flight line.



Below: The linear swap meet runs all weekend.



Frog 249 diesel on the stalls. Boxy but nice.



FROG Bantam 25" ARTF from 'way back'!



Ed Kazmirski Taurus pattern ship on one of the stalls. Electric conversion.

old-timers burble high overhead, smart ladies in elegant summer dresses take tea and nibble their cucumber sandwiches. Well-preserved chaps in panamas and blazers (no doubt with a well-tuned Junior 60 in their past) sit contentedly, sipping a chilled chardonnay. Ah, the English Season! For many of us the ModelAir Old Warden Scale Weekends are up there with The Boat Race, Wimbledon and the Henley Regatta.

WALK THE STALLS

Camping in the walled enclosure at Old Warden is a civilised treat. True, you have to trek a good way to the neat Ablution Block, and no, it does not yet provide showers. However, none of these trifles matter. Nothing can match the sheer joy of waking up on a sunny Saturday morning to the sound of models flying and the aroma of first pressing castor, before taking a tour of the stalls. Scale Days host a running buffet of secondhand stalls, a sort of linear swap meet all weekend. It is not all just about free-flight stuff. If you like old R/C kits, old engines and old radios you will not be disappointed. Personally, I also like a good

root through the new stuff, such as the Redfin model engine stand, and the vast Belair CNC kit panjandrum.

The sort of secondhand stuff you can handle on the public stalls is very evocative. Last year a boxed, complete and working classic Costwold UHF radio system took my eye. The vendor wanted 60 quid. I also spotted a nice FROG 249 diesel, asking £45. A bit further on there was an ancient but



Above: Classic combo - a boxed Costwold Controls UHF/FM transmitter and receiver.



Left: Some classic R/C kits on the stands. Note 'The Duke' by Svenson.



There were quite a few classic control liner kits on offer.

perfect FROG Bantam 25" ready-to-fly model, which was new to me. As for kits, there was a 50" Veron Tiger Moth, for £75 (with some omissions), a Veron Colt control liner for an unknown price, and a classic Dynafite Bird of Time glider for £95.

I also spotted a Svenson 'The Duke' kit, which I believe might be the same as a Svenson Vicomte 1916. However, I am open to correction from knowledgeable Belgian RCM&E readers like Stef De Wit. This model is a faux-vintage Bleriot-like model, in the Cambria Pioneer and Flair Magnatilla genre. Now I happen to like Svenson kits like this, and also the Svenson Westerly trainer, but I don't think the Vicomte sold well over here. However, via the paradox of the retro-market (as per classic cars) those models that did not sell well on debut have now become rare and collectable. The same is certainly true of some old engines, but the boxy and attractive FROG 249 BB diesel I saw on another stand certainly was popular in its day. This very clean example was very appealing, especially with its retroussé compression bar. There was much else to take in, but I had an urgent appointment in the outfield.

THE OUTFIELD

Walk past Old Warden's trademark - and amazingly low-rise wooden control tower - and look for the gate. Pass through this little wicket gate onto the Old Warden outfield and suddenly all traditional aeromodelling life is there. In the shadow of the aeromodel tower the vintage control line enthusiasts race their models, many with the open port bark of un-silenced vintage petrol engines. However, out on the field you will find everything imaginable Free Flight. On a hot sunny day, this a lovely place to be. Everything from 'lifting body' fuselages to free-flight auto-gyros are in evidence. There are shouts of 'Heads!' as powered jets fizz by, and the smell of uncorked ether is everywhere.

Also, I know because they have told me, that many aeromodellers build quirky off-beat aerodynes especially for this gentle but stylish Festival of The Frivolous. It really is worth a good walk around.



Engine maestro, Alex Phinn with some of his range of red diesels.



Enter the outfield by the wicket gate. All aeromodelling life is there.

Seen in the outfield - a Saunders Roe A1. I think it's the Jetex 20" span version.



There is no-where quite like Old Warden.



Above: Keil Kraft diesel powered profile free flyer. Know what it is?

Left: Every year at Old Warden, I seem to spot a different Cox .049 powered F/F helicopter!



“Pass onto the Old Warden outfield and suddenly all traditional aeromodelling life is there.”

RADIO CONTROL

For those of us with aerals in our lives, the radio control line is the big magnet at Old Warden. I spent most the weekend there but sadly it was not bumper Old Warden weather. Frankly, the weather in 2019 was a bit disappointing. The problem was not rain or wind, but a sort of gloomy overcast that washed out all my colours. Lovely models often looked dull, monochrome and back-lit. It was only when a watery sun came out for a very brief spell that you could truly enjoy the scale artistry on display. The consequence was that opportunities for photography were a bit grim. Now and then there were periods of brightness, of which I took full advantage.

SHUTTLEWORTH MODELS

It is traditional for English modellers to build scale Shuttleworth examples. It is also a tradition for many to fly them here at the Scale day. One such was Andrew Hinton's beautifully observed Blackburn 1912 Monoplane. It was hand crafted and based on the David Boddington plan. Regular readers will remember her as the cover star on the May 2020 issue.

For the record, she is built to 1/4 scale, spans 96" and weighs 15lbs 8ozs (seven ounces of that is nose weight, by the way). She is powered by a Laser 150 four stroke glow engine, driving a 16" x 8" Master Aircscrew. She looked just right when - for just a few moments - a weak setting sun shone through her fabric.



Richard Crapp's Westland Wessex. 1/5th scale, 136" span, twin Laser 75s.



Andrew Hinton's Blackburn 1912 Monoplane. Spans 96" with a Laser 150.

Left: Tiger Moth G-AMNN 'Spirit of Pashley' flown by Richard Ginger.

Far Left: Jamie Cuff's 1/4 scale Tiger Moth on a low pass.

Bottom left: Bright red Tiger Moth G-APLU flown by Paul Baker. Laser 75 power.



A FLIT OF TIGER MOTHS

Naturally there were quite a few 1/4 scale Tiger Moths flitting about. I might as well come clean and 'fess up' that with five or more in the air, I may have mixed up one or two and their owners!

A contributory factor was the interval between announcers, when the PA lay silent whilst everyone flew. This is because the laid-back Old Warden Scale Weekend is quite a co-operative affair. Scale pilots often assume other flight line duties to

make it all work. People like Richard Ginger, as just one example, worked like a Trojan behind the scenes. Anyhow, Crash Parry's notes to me state that bright red G-APLU was definitely flown by Paul Baker. This was fitted with an old Laser 75 and sounded purr-fect. Tiger Moth G-AMNN 'Spirit of Pashley', in blue and silver, was, I think, flown by Richard Ginger. Laser designer Neil Tidy flew his Tiger G-AUPJ and J. Young flew G-AZSA.



Richard Ginger also flew this Laser powered Fokker Eindekker E.III 10.



FOKKER EINDEKKER

Richard Ginger also flew his nifty Laser powered Fokker Eindekker E.III 10. It handled the breeze very well. Mind you, Richard is a cracking scale pilot. Like Andrew Hilton's Fokker, she looked superb with the sun behind her on long, low sunset approaches. Sometimes I think this is what Old Warden is all about: sunset flying of fabric covered gadflies.

FOKKER DVII

Mind you, classic aircraft are often weapons of war. Ian Garret's red and white Fokker DVII looked superbly aggressive on low strafing runs. This model was built from the well-known Flair kit and is Laser 70 four stroke glow powered.

I miss all the Flair kits. Especially the scouts.

MORANE SAULNIER LOOKALIKE

We have seen her before, but Julian Barker's atmospherically modded Morane Saulnier Type J lookalike is a sweetie. Based on the Flair Hannibal plan, she has a wingspan 90-inches and weighs in at 6.8 kgs. This Type J is powered by a Laser 150 four stroke glow engine, driving an APC 18" x 6". A convincing conversion that flies well. I like this sort of enhancement of a classic kit!



Above: This might be a Nosen or Precedent based 25% Aeronca Champ L3 Defender?

Right: Mike Inwood's Mick Reeves Spitfire coming out the gloom.



"Just being at Old Warden is a tonic and we all had a great time."



Ian Garret's aggressive Fokker DVII from the Flair kit. Laser 70 FS power.



Julian Barker's niftily modded Morane Saulnier Type J - 90" span with Laser 150.



Above: Camping it up! Crash Parry and F/F scalars Pete Iliffe and Ron Johnson.

THE VERDICT

We could have had better weather, and this undoubtedly affected the turnout. In the end the weekend weather proved kinder than the BBC forecast. Just being at Old Warden is a tonic and we all had a great time. I really do recommend the intimate camping arrangements. Evenings sitting round the barbie sipping wine and chatting with flying buddies old and new cannot be beaten.

It was also great to see and hear Dave Bishop of DB Sound guesting on the microphone for some of the show. Dave announced that this was to be his last starring appearance at Old Warden, but I hope he changes his mind.

OLD WARDEN MODELAIR SCALE WEEKEND 2020

At the moment this is scheduled for the weekend of 25th - 26th July 2020. In the current uncertainty, who knows? Still, I am booking my diary with hope in my heart... ✈

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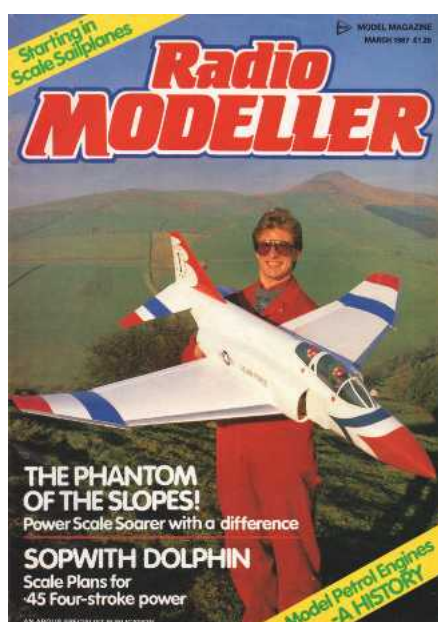
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DRACON

Shaun Garrity describes his restoration of another one of David Boddington's plan feature airframes.

words & photos » Shaun Garrity



Radio Modeller March 1987 included the pull-out plan for the Dracon.

So, what has a Cartier watch, the Coffee King of Brazil and a duck got to do with this month's plan feature? Let me explain...

Alberto Santos-Dumont's father owned a coffee plantation and made a fortune by the clever use of labour-saving machines. Young Alberto was fascinated by the locomotives and tractors on the plantation, even learning how to drive them; he quickly developed a passion for science and engineering. In his biography he mentions that the 'dream of flying' came about contemplating the magnificent skies above his father's Brazilian plantation.

Move on to his late teens and after a balloon flight in Paris in 1887, Alberto started designing balloons and dirigibles (steerable balloons), culminating in his 1901 flight around the Eiffel tower. Interest then turned to powered flight and in 1906 his 14-Bis aircraft made the first documented flight in Europe. Many believed in Brazil that this actually

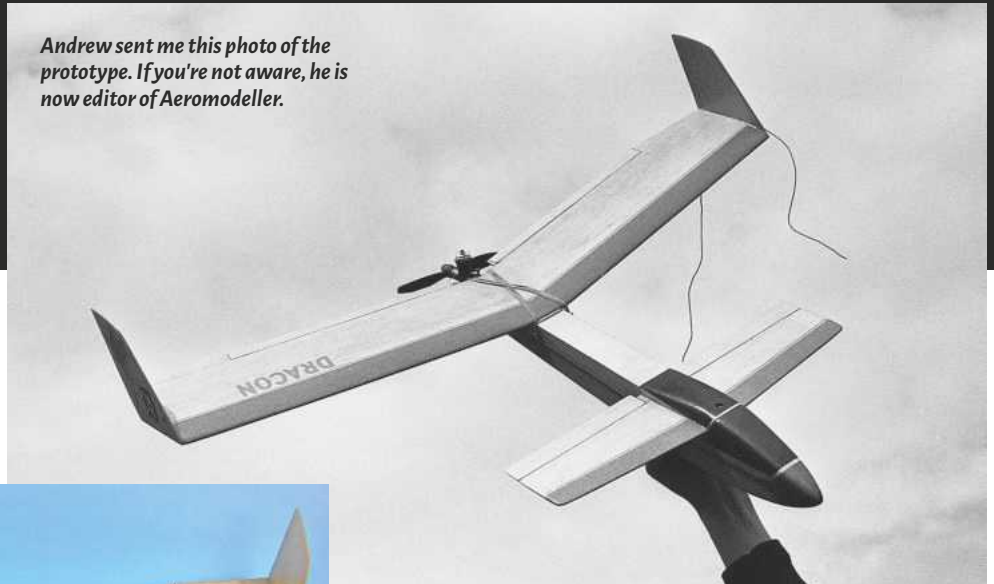
preceded the Wright brothers; history says otherwise but who am I to argue.

Alberto was friends with Louis Cartier, and he mentioned the problems he had when checking his pocket watch while flying. Cartier donned his thinking cap and designed what was the first wristwatch for men - the Santos. (Patek Phillip actually invented the first wristwatch, but it was for ladies.) So, just the duck to explain now...

His aircraft, the 14-Bis, had the main wing at the rear, with the tailplane at the front and when flown before a French crowd many noted it looked like a canard, canard being the French word for duck. The name stuck for aircraft of this type and it brings us nicely back to our free plan, Boddo's Dracon.

Just a side note: one of Alberto's later designs was the Demoiselle (Dragonfly) and this full size 100km/h machine could be built in 15 days, so there's no excuses to not finish a Dracon over the weekend!

Andrew sent me this photo of the prototype. If you're not aware, he is now editor of *Aeromodeller*.



Just as I received it. The Dragon prototype had been stored at the Boddington skunk works for many years before coming into my hands.



The simple but effective Jelovsky wing construction can be seen here. As mentioned, a ply dihedral brace was added after the wing snapped.

DAVE'S DOODLES

Dracon started as a series of doodles by David Boddington; the following is an excerpt from his original article:

"My first effort was of modest dimension, designed for a Cox 0.049 reed valve engine (they run in either direction) and utilising all sheet balsa construction with a Jelovsky type wing. Fortunately, my son Andrew took a fancy to the doodle and put it into a three-dimensional form by building the model. The wing was originally designed to have only chord wise ribs but as it flexed cross ribs were also added. Construction is certainly simple – no point in going mad for a design that was definitely in the realms of fantasy".

As it transpired the first flights were an anti climax and as Boddo mentioned, "...it went away as if it didn't realise that it was back to front, control response movements were smooth and positive, and the little canard had a fair turn of speed".

However, it wasn't totally problem free and there were issues with the wing construction. As mentioned, diagonal ribs were added to stiffen the wing, but this had the adverse effect of focussing stresses to the wing centre. No dihedral brace was used, the centre joint was butt-jointed and guess what happened? Yes, it snapped with a clean break. The model survived and the wing centre section was quickly repaired but it was now reinforced with an epoxy

and bandage strip over the joint. When the plan was published a dihedral brace had also been added.

A DILEMMA

A number of years ago my good friend Andrew Boddington gave me the original Dracon, so do I restore, refurb or build new? I thought it would be appropriate to restore the prototype and get it pointing skyward again.

If you have any concerns about its flying characteristics, as an experiment Dave actually trimmed it for free flight, taping up the elevator and ailerons. It behaved impeccably.

FUSELAGE

This is basically a simple box. To update the Dracon, I decided to ditch the Cox and go electric, so a few tweaks are necessary. One point that Andrew mentioned is the model could easily come out nose heavy so keep the gear well aft. A modern 9-gram servo is adequate for the elevator and should help over the original, much weightier item.

Start by cutting out the 1/16" balsa sheet sides and ply doublers, then glue up, making a matching pair. Now add the 3/32" balsa rear doublers. Cut out F1 – F8, replacing any birch ply formers with lite ply. Start by building the fuselage inverted, ensuring it's accurate. Add the cross-

These excellent tissue logos show what can be done with a little imagination and a sharp blade.



Mounting the elevator servo on the foreplane makes for a very positive, slop free linkage.



“To update the **Dracon**, I decided to ditch the Cox and go electric.”

Left: Aileron pushrods are simple and direct. I used plastic kwik-links instead of metal to help prevent any potential damage if the wing caught on landing and skewed.



The tissue trim has now faded but the colour scheme can be clearly seen on the image lifted from the original article.

grained underside 1/16" sheeting to F2 and leave to set. This will give some structural integrity and prevent warping when pulling the nose together to fit F1 in position. Glue on the nose block and roughly shape, finishing off the remaining underside sheet and the top 1/16" sheet between formers F3 to F6. Tack glue the soft 1/2" balsa block for the wing fairing and permanently glue the canopy block in place, then sand everything to shape. The fuselage can now be put to one side while you get on with the foreplane and wing.

FOREPLANE

Use medium light 3/16" balsa for this and don't omit the cross-grained tips as they prevent warping. For the elevators, medium 1/8" balsa is specified but this isn't a problem because, as you will see on the plan, the foreplane is sanded to an aerofoil section so they will blend in.

Once shaped form the 18g piano wire and tube elevator joiner and glue in place, along with the 1/8" hard sheet filler. You could hinge the elevators now depending on your finish of choice. If using heat shrink film then cover first and hinge later, but for a simple dope and tissue trim finish, hinge now. Glue in furry Mylar types or use stitching - both work well.

WING

These are very simple and quick to build so start by cutting the ribs first. Inspecting the

plan, you'll see the front part of the wing is made from 3/16" and the rear portion from 1/8". Both are medium sheet balsa; this is necessary to help form the aerofoil section and save on unnecessary carving and sanding. For each panel position the *leading to trailing edge* ribs over the plan then glue the two balsa sheet pieces in place, not forgetting to angle the root ribs to give the correct dihedral. When dry flip over and add the diagonal ribs, taking care not to introduce any warps. Sand the sheeting to the correct aerofoil profile then join the two wing panels, cutting out the root ribs etc. where necessary to fit the 1/8" ply dihedral brace in position. As mentioned above, if you don't want your wings to emulate Dave's prototype add the epoxy bandage reinforcement as well. Add the tip fins, ailerons and the job's done, other than shaping the soft block wing fairing to fit the wing.

PAINTING AND DECORATING

The fuselage, foreplane and tip fins can be film covered but this type of wing construction doesn't lend itself to film covering; it would be a fiddle on the underside because the ribs are not meant to be enclosed so simply sealing the balsa with dope or water based satin floor varnish will suffice. You could film cover the upper sides of the wings but why not go retro and use tissue and dope for trimming and finishing the model as per the original?



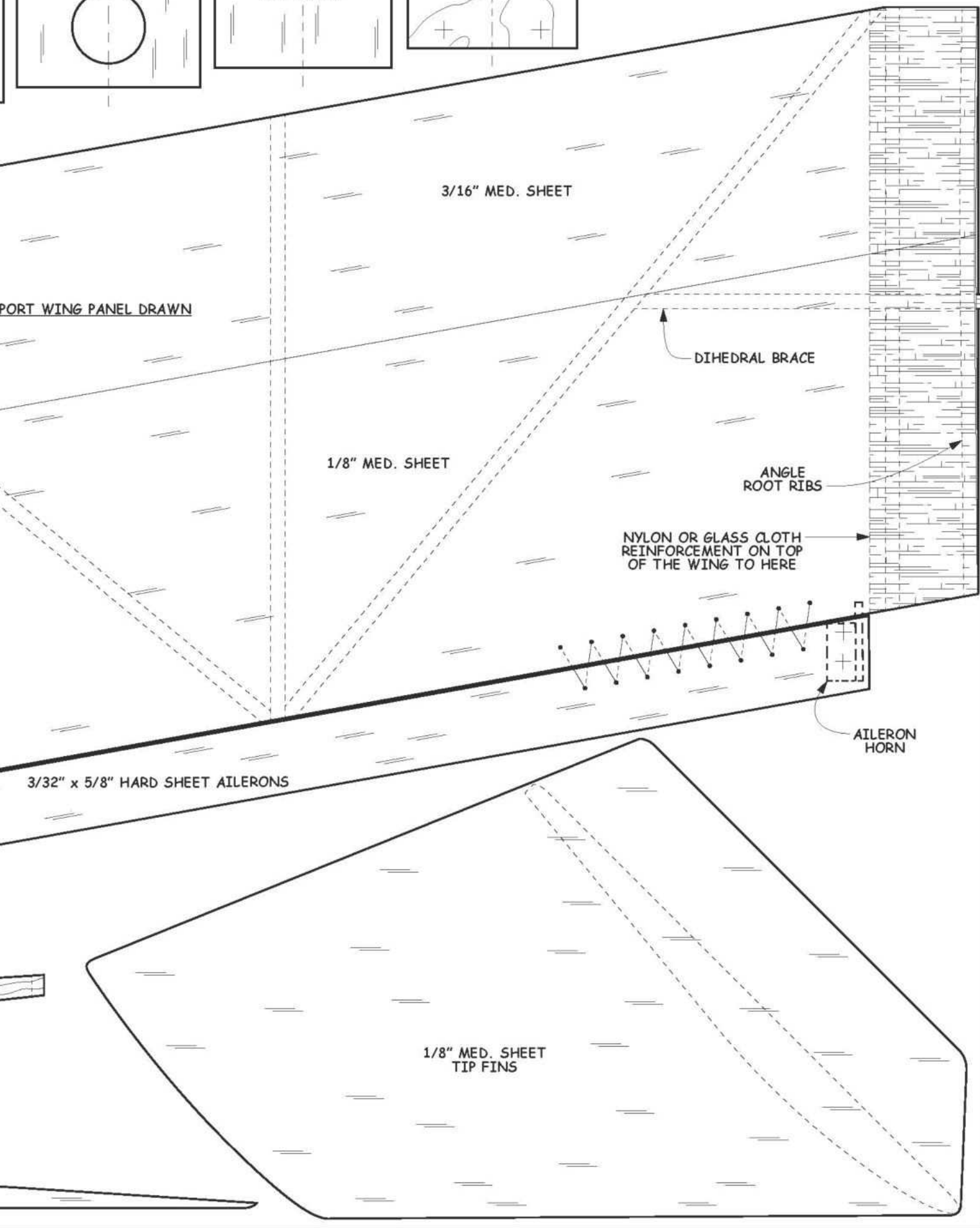
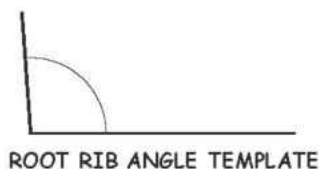
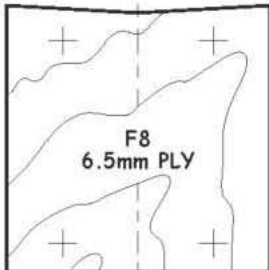
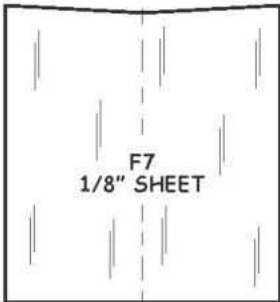
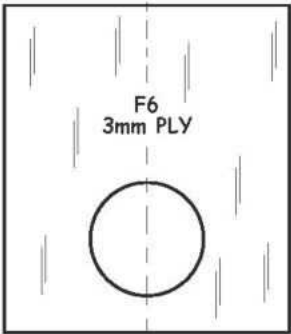
I found this brushless bell motor in the scrap box. Not ideal due to the low kV rating but with a 7 x 4 prop on 3S it delivered around 65 watts - more than the original Cox Babe Bee, rated at 42 watts.

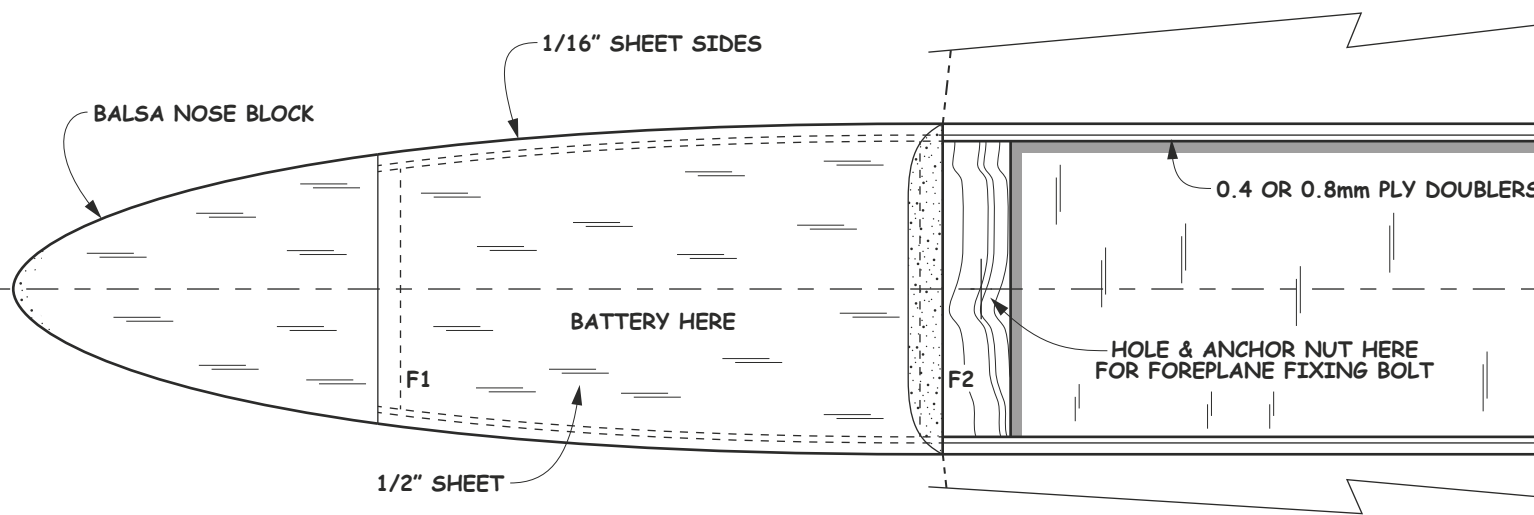
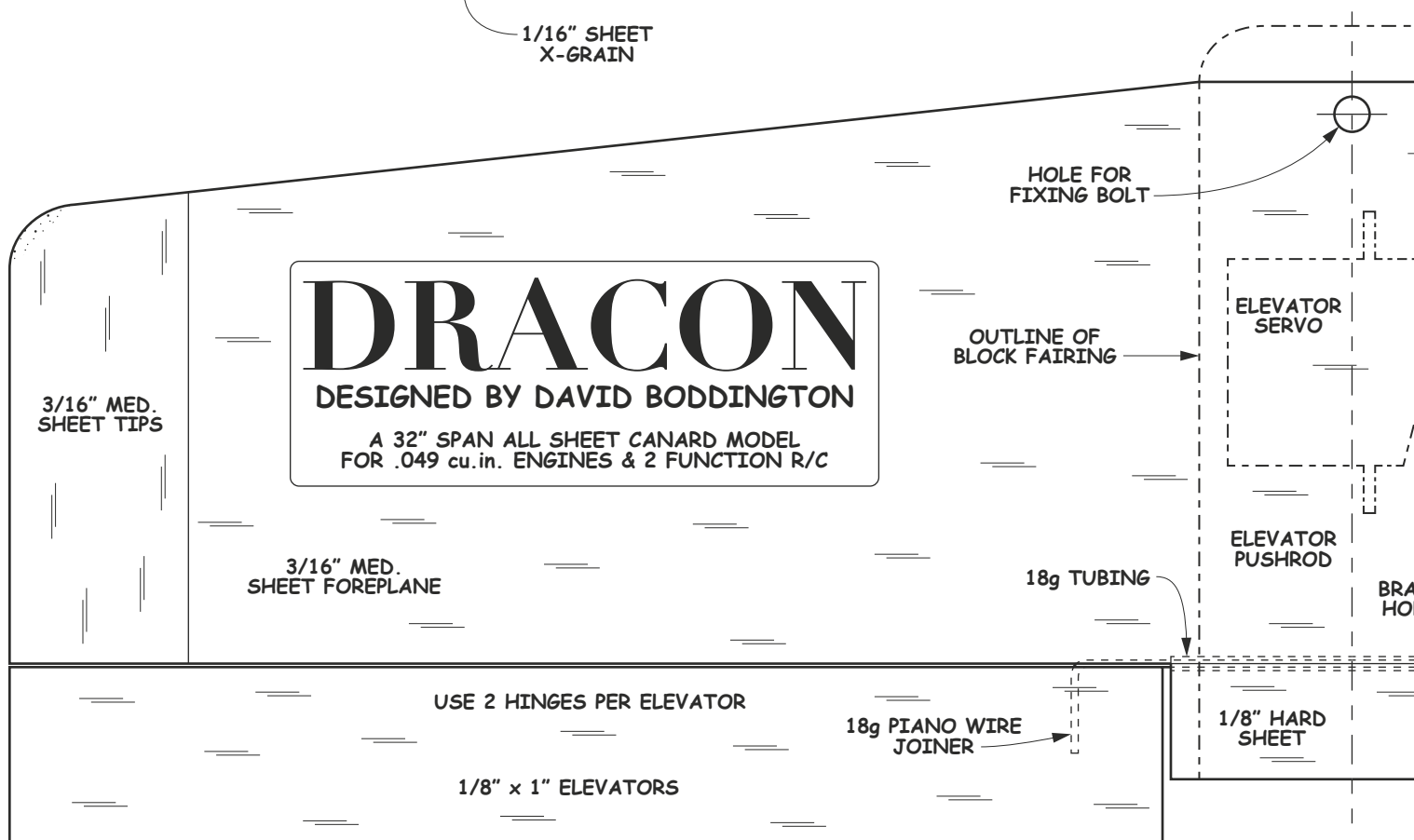
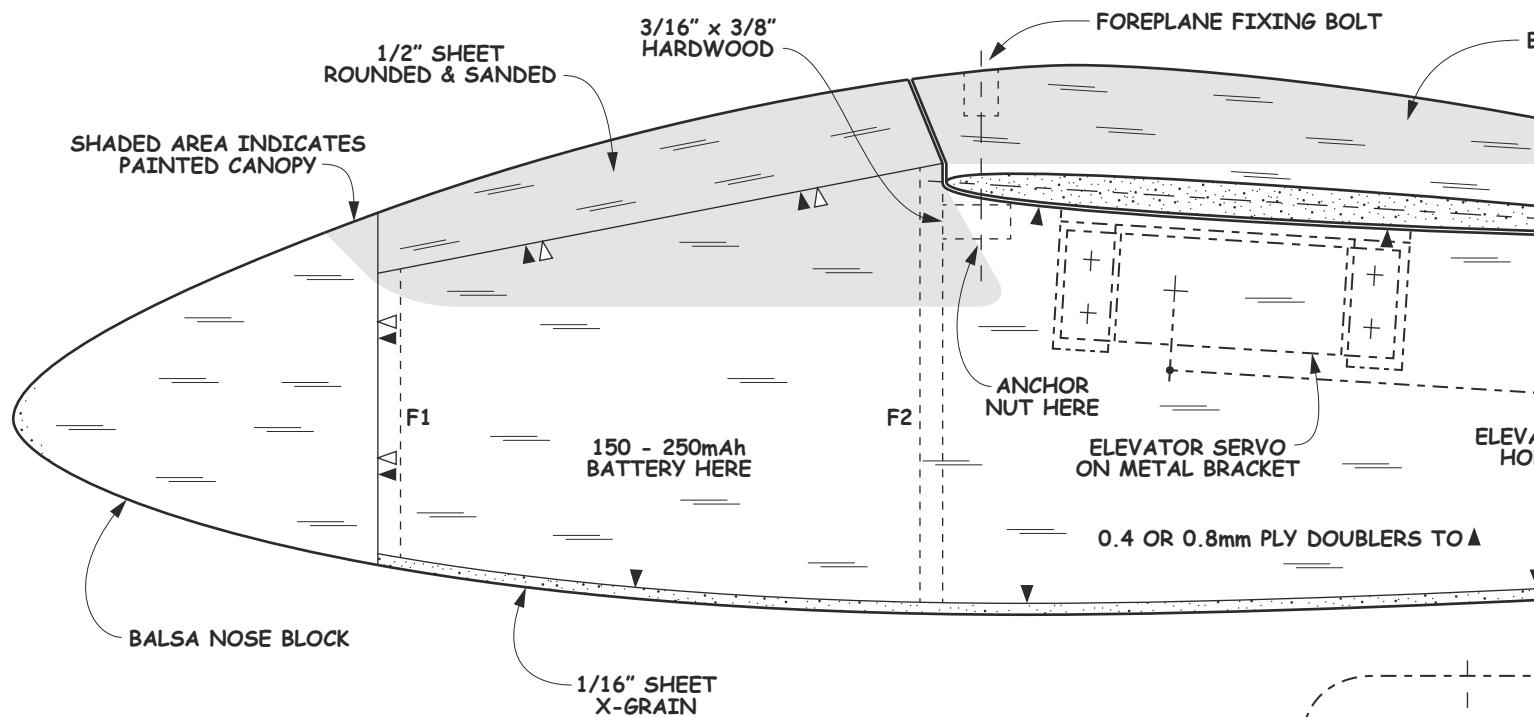


A 12A ESC fits neatly here, leaving just enough space for the LiPo.

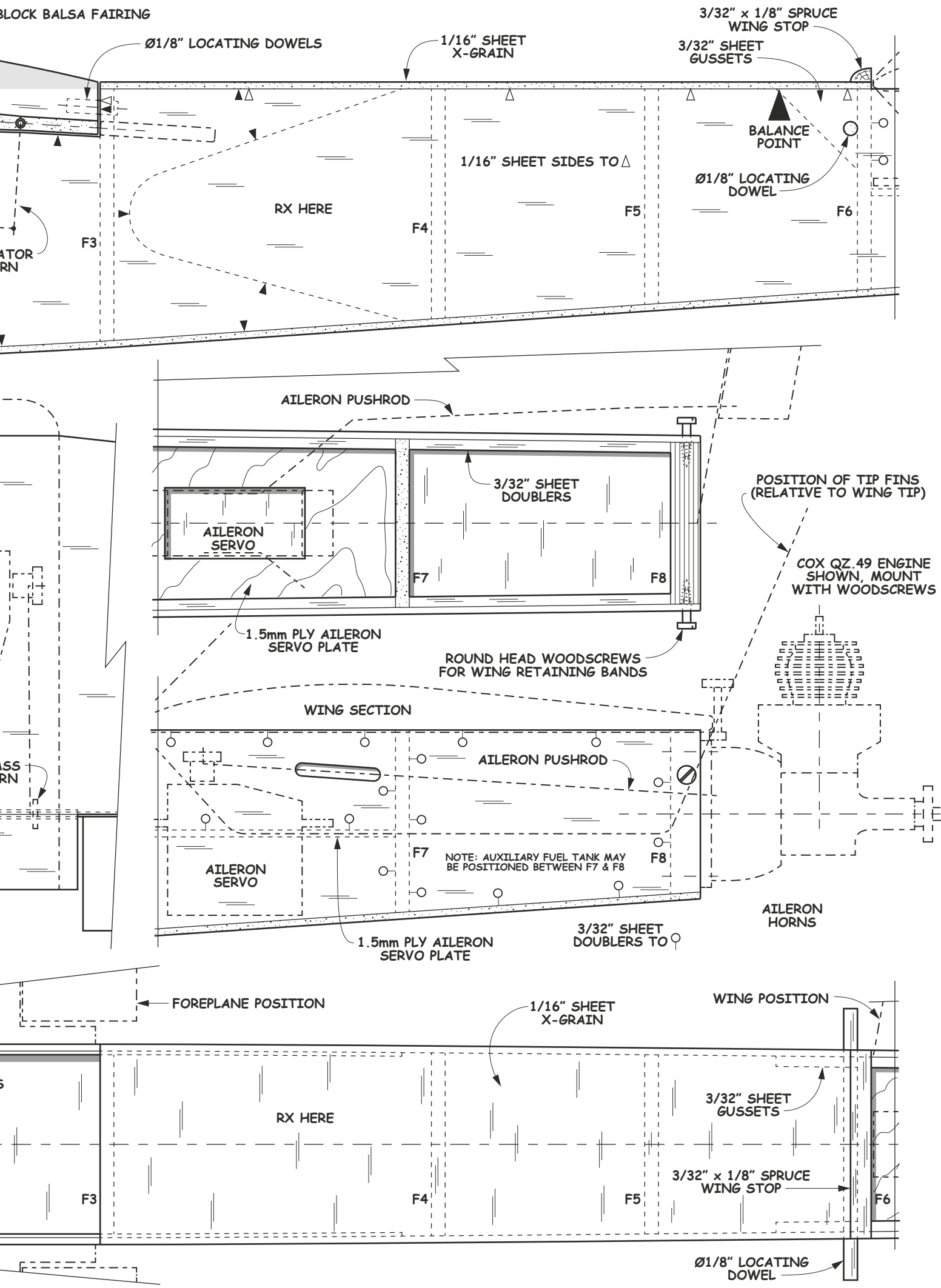


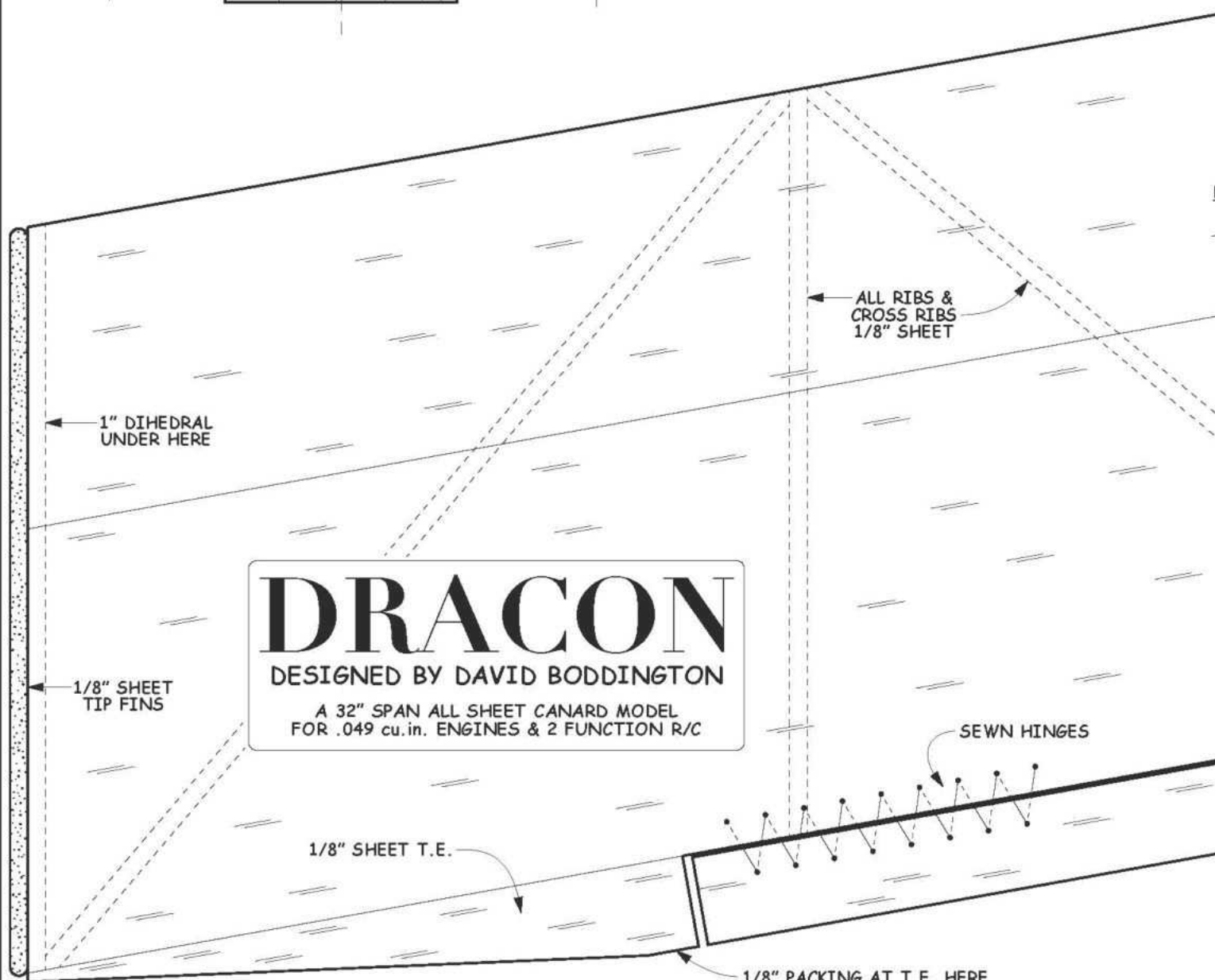
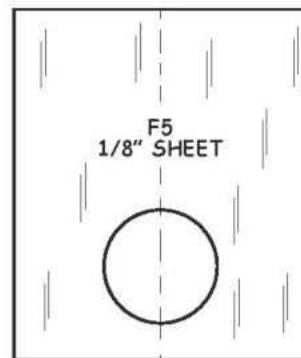
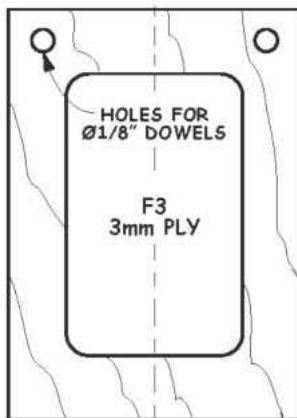
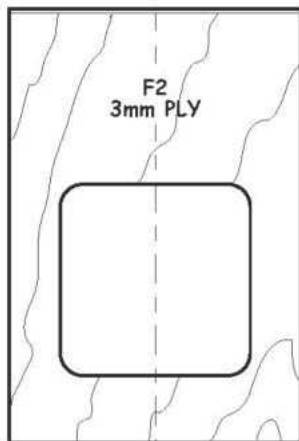
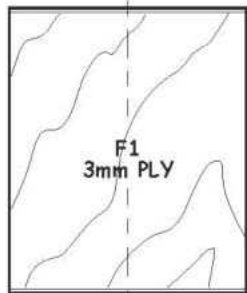
Aileron servo location, along with the LiPo. A bit of a squeeze but when building from scratch modifications can be made to suit a larger pack.





BLOCK BALSA FAIRING

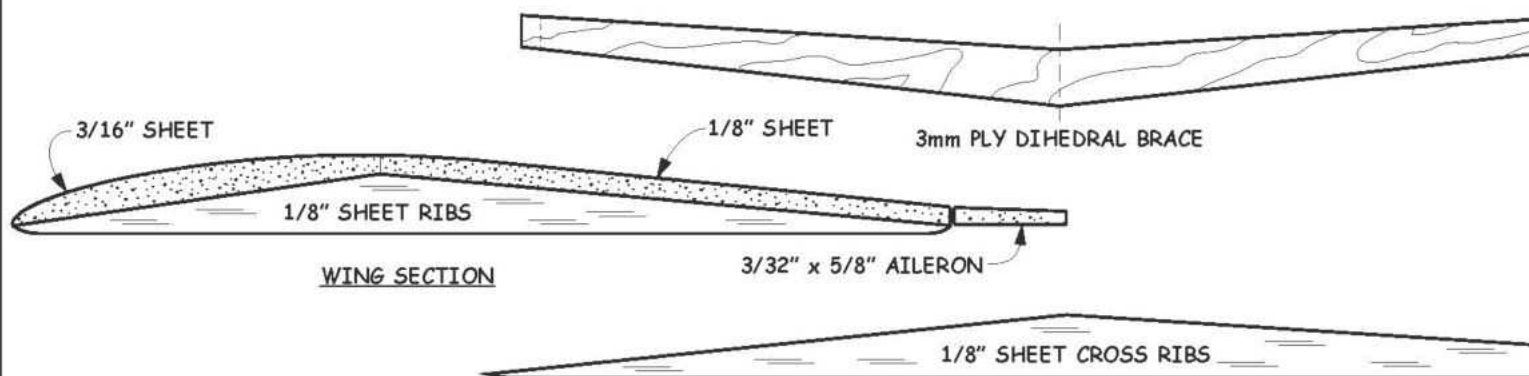




DRACON

DESIGNED BY DAVID BODDINGTON

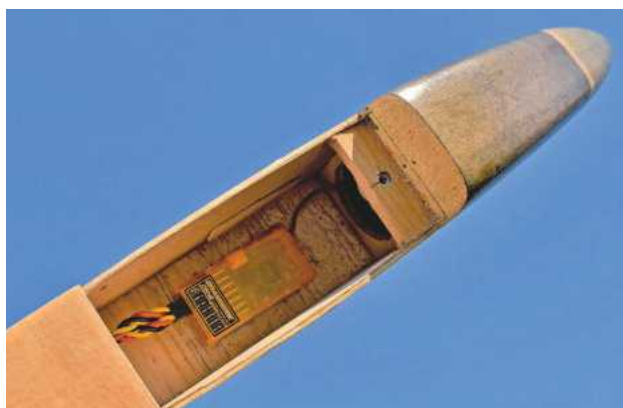
A 32" SPAN ALL SHEET CANARD MODEL
FOR .049 cu.in. ENGINES & 2 FUNCTION R/C



“You will not be disappointed with this quick build, low cost and very different model from the 1980s.”



Ready to go, 33 years on from Dracon's first foray skyward.



Plenty of space up front for the receiver. If Dracon is coming out nose heavy than move it towards the tail, behind the foreplane.



Remember on a canard up elevator moves the nose down. Get it wrong and you'll have an interesting test flight!

DATAFILE

Model type:	All sheet sport canard
Wingspan:	32" (813mm)
Length:	24" (610mm)
Weight:	12 - 130ZS (340 - 369g)
Power (IC):	.049 Cox Babe Bee
Power (Electric):	2205 - 2300kV brushless motor
ESC:	15 amp with BEC
LiPo:	2 or 3S, 500 - 1000mAh

One thing regarding floor varnish is, although it has worked well for me as a simple clear coat, I've not had repeatable success when adding tissue trim over floor varnish finished balsa. The tissue does not always adhere well, especially at the edges, so I stick with dope.

In order to retain the patina of the prototype model I simply cleaned it up with thinners (Andrew told me the original had a final coat of two pack fuel proofer, so thinners wouldn't make a gooey mess). I was very tempted to redo the tissue trim but decided against it, just giving the model a quick overall blast with clear spray polyurethane to lift the colours a tad.

If you are going to use IC power, then give the model a coat of fuel proofer. Polyurethane will do fine for diesel but use a propriety fuel proofer for glows. The high nitro blends that Cox 049 motors prefer are not very kind to dope.

ELECTRICS AND RADIO

Just two servos, an ESC of around 15A and a 2 or 3S LiPo are all that's needed when going e-power for this simple model. Nine-gram servos are ample, and you don't need a lot of power, 60 - 80 Watts is more than enough; Dracon isn't a pylon racer. Ideally choose a motor such as a 2205 - 2300kV to keep the prop size around 6" max., because being a pusher with a swept back wing you'll potentially have problems with bigger props hitting the ailerons. Position the LiPo to achieve the correct C of G. You may have to modify some of the formers to achieve this and don't forget to make a hatch. As I was retro fitting the e-power set up I had to squeeze in a 500mAh 3S LiPo as shown into the available space.

TIME TO FLY

Check the C of G, the prop spins the correct way, everything is warp-free and that the

control throws are in the proper direction - remember on a canard up elevator pushes the nose down! The prototype flew with no trim changes necessary and Dave described it as "a sweetie to fly". You will not be disappointed with this quick build, low cost and very different model from the 1980s.

Boddo suggested he would possibly make a larger camera carrying version at some time. If you get inspired to do the same let me know. Now, where are my sheets of 6mm Depron, the hot glue gun - and is there enough in stock to go 300%? 

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PP-UBEC6A	6A UBEC, 7A Peak, 6-25V I/P	£18.62
PP-UBEC20A	20A UBEC, 22A Peak, 9-50V I/P	£24.99
5A UBEC	With Switch and Digital Display	£16.99
15A UBEC	With Switch and Digital Display	£29.99

Outrunners — Professional Black Series

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PO-2834-	910kv, 1020kv, 1160kv, 1680kv	£27.49
PO-3535-	870kv, 1090kv, 1390kv	£28.99
PO-3541-	920kv, 1070kv , 1270kv	£33.99
PO-3547-	700kv, 800kv, 960kv, 1190kv	£35.99
PO-5055-	500kv, 595kv	£61.00
PO-5065-	360kv, 420kv	£75.50
PO-6366-	230kv	£97.75

Part numbers in **RED** are approved by the BMFA for their Payload and Egg Challenges

Great Value Quality Servos **From £2.42**

	Part Number	Type	Torque / Speed	Price
	4M-045DH-005	Digital Sub Micro 4.5g	0.5Kg @ 4.8V - 0.10sec/60° 0.6Kg @ 6.0V - 0.08sec/60°	1pcs £4.49ea 5pcs £4.04ea
	4M-056DHVMG-009	Digital High Voltage Metal Geared - 5.6g	0.90Kg @ 4.8V - 0.14sec/60° 1.05Kg @ 6.0V - 0.12sec/60° 1.20Kg @ 7.4V - 0.10sec/60°	1pcs £8.99ea 5pcs £8.09ea
	4M-094DMGB-014	Digital Metal Geared Ballraced Wing Servo Only 8mm Thick - 9.4g	1.4Kg @ 4.8V - 0.12sec/60° 1.9Kg @ 6.0V - 0.10sec/60°	1pcs £10.99ea 5pcs £9.89ea
	4M-090AH-017	Micro Analog 9g	1.7Kg @ 4.8V - 0.09sec/60° 1.9Kg @ 6.0V - 0.07sec/60°	1pcs £2.69ea 5pcs £2.42ea
	4M-100AMG-022	Micro Analog Metal Geared - 10g	2.2Kg @ 4.8V - 0.12sec/60° 2.5Kg @ 6.0V - 0.10sec/60°	1pcs £4.99ea 5pcs £4.49ea
	4M-100DMG-022	Micro Digital Metal Geared - 10g	2.2Kg @ 4.8V - 0.12sec/60° 2.5Kg @ 6.0V - 0.10sec/60°	1pcs £6.49ea 5pcs £5.84ea
	4M-160AH-027	Mini Analog 16g	2.7Kg @ 4.8V - 0.13sec/60° 3.0Kg @ 6.0V - 0.11sec/60°	1pcs £5.99ea 5pcs £5.39ea
	4M-175DMG-030	Mini Digital Metal Geared - 17.5g	3.0Kg @ 4.8V - 0.13sec/60° 3.5Kg @ 6.0V - 0.11sec/60°	1pcs £7.49ea 5pcs £6.74ea
	4M-253AB-028	Standard/Mini Size Ballraced - 25.3g	2.8Kg @ 4.8V - 0.12sec/60° 3.3Kg @ 6.0V - 0.10sec/60°	1pcs £5.99ea 5pcs £5.39ea
	4M-410ABH-052	Standard Analog Ballraced - 41g	5.2Kg @ 4.8V - 0.20sec/60° 6.5Kg @ 6.0V - 0.16sec/60°	1pcs £4.50ea 5pcs £4.05ea
	4M-455AH-033	Standard Analog 45.5g	3.3Kg @ 4.8V - 0.15sec/60° 4.0Kg @ 6.0V - 0.12sec/60°	1pcs £6.12ea 5pcs £5.51ea
	4M-556AMG-087	Standard Analog Metal Geared - 55.6g	8.7Kg @ 4.8V - 0.15sec/60° 9.4Kg @ 6.0V - 0.13sec/60°	1pcs £11.99ea 5pcs £10.79ea
	4M-556DMG-087	Standard Digital Metal Geared - 55.6g	8.7Kg @ 4.8V - 0.15sec/60° 9.4Kg @ 6.0V - 0.13sec/60°	1pcs £16.99ea 5pcs £15.29ea
	4M-556AMG-118	Standard Analog Metal Geared - 55.6g	11.8Kg @ 4.8V - 0.20sec/60° 13.2Kg @ 6.0V - 0.18sec/60°	1pcs £13.99ea 5pcs £12.59ea
	4M-556DMG-173	Standard Digital Metal Geared - 55.6g	17.3Kg @ 4.8V - 0.18sec/60° 20.4Kg @ 6.0V - 0.16sec/60°	1pcs £16.99ea 5pcs £15.29ea

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FMS PITTS S2

David Ashby flies the Pitts Special that he's always wanted. words & photos » David Ashby



After a while you tend to get a feel for model manufacturers, and you realise whether they're run by model aircraft enthusiasts, accountants or just people thrown in by fate. In FMS' case it's certainly the former. The business has been around for a few years now yet its commitment to continuous improvement isn't in doubt. I didn't read that on a press release, that's my sincere opinion based on experience of flying their models, from the first big foamie, the 1.4m span Mustang that arrived in 2010 (and has now seen eight revisions), through to last year's 3m span Fox glider.

There's a sentence on the Pitts packaging that made me smile; 'while ensuring that the Pitts Special is faithfully recreated, FMS has worked hard to minimise its profit margins in the hope that pilots who love the Pitts V2 will find it affordable'. On several levels, don't you just love that.

The Pitts should need no introduction. Can you believe the prototype first flew in 1944? It went on to become an aviation classic, a machine that dominated aerobatic competitions in the 1950s and 60s and which has delighted airshow crowds ever since.



Ignore the pilot and everything else looks just right to me!

I was flying low inverted passes on the first flight. It feels predicable at any attitude.



“It arrives superbly packaged - my model was blemish-free...”

If you've ever seen one, then you'll know how tiny it is. FMS have emulated the two-seat S2 version but even that spans just 20ft, making this 1.4m span model a respectable 1/4 scale, give or take.

VERSION 2

FMS' Pitts V1 never really caught on. The poor trim scheme didn't help, but they've thoroughly revised the model and nailed the decoration with the classic colours you see here. It's moulded using EPO foam and supplied 'ready to fly', requiring the addition of a 6-channel receiver and a 6S 4000mAh LiPo battery.

Four 17g metal gear servos do the hard work and a 50A Hobbywing ESC manages the power. Reliable items all. There's an on-board Reflex-branded gyro too, a 32-bit 3-axis unit compatible with all radio systems - connection to the receiver is all that's required. The gyro has three switchable modes - Off, Stabilised and Optimised; more on these later.

ASSEMBLY

It arrives superbly packaged - my model was blemish-free - and quality levels are high, much as we now come to expect from the brand. Let's, though, tackle that 'elephant in the room' first - the pilot. It's far too small - you know it, I know it and perhaps one day FMS will know it. It can be replaced with a little surgery and if you're after a 1/4-scale alternative then check out Hangar 9's RV-4 pilot figure (£13.99), which should do the trick.

You'll be impressed by the undercarriage. Foam spats tend to look dented and shabby after a few flights, but both the plastic spats and leg covers

supplied are of a flexible polythene type, so are very robust. There are ball link connectors linking control surfaces to servos throughout and the large canopy hatch reveals a cavernous interior.

Overall, the proportions look good. The fuselage easily swallows the suggested 6S pack and larger packs too, say FMS. Assembly is straightforward and glue-free. A 2mm hex driver and crosshead screwdriver are all you need, along with a nip from a spanner to tighten the prop nut. Everything slots together easily, with the slide-in wing struts being particularly good. When that's done it should fit in most cars, but if you do need to store and move it in sections then field prep will take no more than a few minutes.

SET UP

That short nose means the battery pack needs to sit under the cabane struts and a neat slide-in tray with Velcro straps takes care of that aspect. Six-cell LiPos can vary in size and weight but my model balanced where intended with a 780g 50C 4000mAh OptiPower pack. Lazily, I haven't measured the power system with this one, suffice to say there's plenty of urge; not too much but just enough to endow the model with a punchy scale-flying ability.

The on-board gyro sits in-line between the servos and receiver. FMS say it has been programmed for the Pitts. It automatically recognises SBus, PCM and PWM systems and monitors ailerons, elevator and rudder. A cable labelled SBus/PCM/PWM leaves the unit and should be connected to a spare Rx channel to which a three-position switch should be allocated. Looking at those modes in detail:



A slide-in battery tray aids pack changing. There's bags of room inside.



My spinner and prop were perfectly balanced straight from the box.



Wing struts simply slot into position



A Reflex 3-axis gyro was factory fitted and sits between the Rx and servos.



Four 17g metal gear servos do the work.



The tail struts clip into position. There are ball-link connectors all round.



The spats and U/C fairings are all of a robust polythene-type plastic. Note the strong wire leg, too.

- **Off** - this is self-explanatory and allows the model to be flown manually without any form of assistance.
- **Stabilised** - designed for the less experienced or nervous pilots. This is a self-stabilising function that automatically levels the wings. The model climbs under full throttle while 50-60% power maintains level flight.
- **Optimised** - this equates to auto-stabilisation but without self-levelling. The control surfaces counteract the effect of wind and turbulence to help smooth out the flight pattern.



Servos live in the bottom wing and move the top wing ailerons via pushrod links.

Both high and low deflection control throws are suggested. The low rates are good starting points and still help deliver rolls and loops, although higher rates will be needed for the more aggressive spin and flick-type manoeuvres.

FLYING

Those who fly the full-size machine describe the Pitts as an honest airframe. There's nothing sinister lurking, no nasty traits to surprise unwary pilots, yet it won't disguise a lack of talent either and mistakes will be evident for all to see. It's fast and agile ('not a footrest', as one pilot describes...) with a distinct torque pull to the left during a short take off run.

The model exhibits no such take-off tendencies and rises gracefully after a short roll. To my mind the power seems just right and quite in keeping with the type. Not so much as to render the flight unrealistic, but enough to pull the manoeuvres with the authority you'd expect from a Pitts. It'll pull a decent loop from level flight for instance.

Let's talk about the gyro first. Experienced and intermediate pilots will find Stabilised Mode far too intrusive as they fight a gyro that's trying to keep the wings level. It's just a bit of a nuisance. This isn't a model for beginners so a 'heading hold' mode of some sort would have been preferable. Thankfully, Optimised Mode doesn't feel intrusive at all. Climbing to height, I've tested the stall response using Optimised and gyro-off. In both cases a gentle wing drop is all I've managed to coax, but only after the model came to a standstill, with the Optimised setting working to delay the wing drop for a few seconds.



A contrasting scheme on the underside helps with flying visibility.

I've flown several Pitts models over the years and, in some cases, have been disappointed. Perhaps it's because I just love the aircraft so much, that traits such as adverse yaw and wonky incidences have combined to render some models pretty darn horrible. I was praying that FMS had done their homework before switching the gyro off and, do you know what? They have. It's bloody fab; predictable and positive in roll without any adverse yaw evident.

To be honest there isn't a huge difference in feel between 'Optimised' and 'Off', which says a lot about the model. The roll response is fine at low rates - not too slow, but most pilots will increase the deflections to coax a faster, more axial manoeuvre. To my mind exponential isn't required at low rates but there's no harm in adding a little should you wish. Just don't set off with 30-40% for the first flight as that could induce an unresponsive feel at the sticks.

Knife-edge needs the higher rate rudder to hold it, plus a little work at the sticks, and a bit more effort if the gyro is off too, but nothing that's unmanageable. Inverted flight needs some upward elevator stick pressure, but the model feels composed and solid the wrong way up. I felt comfortable enough to fly low inverted passes during the first flight.

Spat wheel clearance is good so the model won't be troubled by longer grass runways.





The colour scheme is a vast improvement on the V1 version.

DATAFILE

Model Name:	Pitts Special (V2)
Model type:	RTF scale aerobat
Manufactured by:	FMS
UK distributor:	CML Distribution www.cmldistribution.co.uk
RRP:	£259.99
Wingspan:	1400mm (55")
Fuselage length:	1298mm (51")
All-up weight:	3500g (7.7lbs)
Wing area:	748 sq.in.
Wing loading:	150z./sq.ft.
Power system:	4258-size 460kV outrunner, 15" x 9" prop, 50A ESC
Connector type:	XT60
Required to fly:	6S 4000mAh LiPo battery



You can slow it right up for landing and a gentle touchdown without fear.



Entering knife-edge reveals some coupling, but nothing onerous.

“...low rates are good starting points and still help deliver rolls and loops.”



There's little to choose between the Gyro-off and Optimised modes. Stabilised Mode is too intrusive though.

PITTS FULL STOP

Full size pilots tend to adopt a side-slipping or curved approach to land as a way of improving visibility from the cockpit. It's fun to mimic that and the colossal drag you feel with some bipes isn't too evident, so the model doesn't seem to stop dead in the air the moment you ease back on throttle and you can slow it right up, balancing throttle and elevator, for a slow, gentle touchdown. FMS say it'll accept larger batteries although I enjoy a decent seven

minutes with my 4000mAh packs, so I've not flown anything else.

Finally, the Pitts I'd always hoped for! This is a great semi-scale sport aerobat that looks good and flies really well. With a street price of around £225 it's also a release that'll give industry peers something to think about. That you can buy a 1.4m span Pitts that looks this good and flies so well for so little is pretty darn astonishing. As I said, they're model aircraft enthusiasts those folks at FMS. ✈️

'TIS THE SEASON OF THE SWAPMEET



It was ever thus: canny modellers weighing up, haggling and buying.

Whittaker's own club's swap meet came just days before the lock down

words & photos » Alex Whittaker

To everything under the heaven, there is a season. In my traditional modeller's year early season swap meets are the harbingers of spring. If all the auguries have turned out well the winter building season phases out with the coming of the mad March days, thus leaving many of us with just the covering and finishing stages of our winter projects. Suddenly it is bright and breezy. Light levels and temperatures are on the rise, and swap meets abound, like the springtime daffs.

BULLDOG SPIRIT

However, this year it is different. Those of us who lived through The Great Bog Roll Crisis of 2020 were then buffeted by the cruel wind of swap meet closures. Up and down the country prudent swap meet organisers were having to contemplate calling a halt. All those dodgy pensioners in one room, fighting over the last Mills .75, posed too much of a risk.

However, here on the rim of the modelling galaxy in Far North Wales, with no cases confirmed, there was no word of closure yet from the Authorities. Our club swap meet went ahead. Aye, just two weeks or so before the Government suggested closures of all such smaller public meetings.

ATTENDANCE

First of all, attendance of both traders and visitors was undoubtedly down. However, a hard core of swap meet enthusiasts travelled just to be with us. This show of solidarity was received with deep gratitude by their DMFC cousins. Anyway, as you can see from my snaps, we certainly had enough attending to provide a broad range of bargains. Furthermore, as a friendly and laid-back social occasion, our humble club swap meet always attracts keen returners every year. There was not a lot of handshaking, or close quarter embraces, but we got by.

VIC SMEED COQUETTE

We seem to have more than our fair share of nicely hand-built models for sale, as well as modern wooden ARTFs and Hobby-Konger foamies. On entry, I was immediately entranced by an immaculately finished, scarlet classic. This was a double-sized Vic Smeed Coquette biplane. Elegant and classy, the asking price was a very attractive £80. Ideal for long, lazy, summer evenings up the patch.



Double-sized Vic Smeed Coquette biplane. Immaculate bargain.



Above: This smart Extra 300S ARTF was worth a second look.
Left: Hobby Zone Delta Ray, with everything, including battery.

DELTA RAY

Casting about, I soon spotted an interesting foam ARTF twin: a Hobby Zone Delta Ray. It was smart, un-dinged and fitted with everything, including a battery. All for a lowly fifty quid. Even a balsa lover such as I was tempted. A good 'chuck in the car boot and go flying' model, with all the fun of a twin.

AUTOGYRO

I also spied a neat foam, electric, pod-and-boom autogyro for sale. It was going for a wallet-friendly £35. Unimaginatively named a 'Gyro-G', I came close to buying it. It looked a great way to get yer feet wet with rotary wings for not a lot of money. In the end I did not buy. I still honestly believe that one day fate will allow me to stumble upon an unmade DB Auto-Gyro kit.

MM SPITFIRE 24

Traditional kits are always of great interest. It is amazing exactly what shows up each year at our humble bash. This year I spotted three kits that might suit traditional modellers, especially so, given the recent rise of the UK retro movement. First off was a nifty 44" span Micro Mold Spitfire MK 24 kit. Asking price was a very fair sixty quid. Extra parts in the kit are included to make the the Seafire FR 47 variant. It required a .19 - .25 glow engine.

DB MODELS MOTH 40 FS

Next off, for a starting price of £95, was a DB models Moth 40 FS. This kit is 58" in span and designed for .40 - .50 sized engines. These build into very nice models, which are good flyers. A handy clubman size, too.



Foam electric pod-and-boom 'Gyro-G'.



Micro Mold Spitfire Mk. 24 kit. Parts were included for the Seafire FR 47 variant.

Left: DB models Moth 40 FS. Classic kit is 58" in span and designed for a .40 - .50 glow.

Below: Very rare Beta Models Solar Delta for .35 to .40 power, 3 - 4 channels, 48" in span.

BETA MODELS SOLAR DELTA

Third kit of note was a new one on me. It definitely had the look of the groovy Seventies with its 'computer font' lettering on the box. This kit was aimed at .35 - .40 power, 3 - 4 channels and is 48" in span. A bit like a scaled-down Peter Russell '363' trike-undercant delta, she looked quite handsome (and practical) on the box art. The ancient kit sticker indicated she was distributed by Flair Models, of blessed memory. A great buy for the UK retro-enthusiast. Asking price was £60.





Left: World Models Super Sports Senior. 81" span for .90 FS power.
Below: Mystery Model: AH Designs kit for a light aircraft of unknown make.

WM SUPER SPORTS SENIOR

There were a number of untouched wooden (internal combustion designed) ARTFs on sale. One particularly caught my eye because I have one exactly like it in my shed. This was an 81" span, .90 four-stroke World Models Super Sports Senior from Steve Webb Models. It was on sale for £125. Now this was a snip, since in the shop a new one currently will cost you £225. I also flew the smaller .40-.60 sized version for many years. I gave up counting how much fuel I put through her after fourteen gallons. I then flew this larger version and it is an absolute honey. Docile but aerobatic, she is an easy-to-land large model that does not require the use of flaps for a slick landing.

PROJECTS

Swap meets are always happy hunting grounds for exotic, part-completed builds. In addition, one sometimes encounters attractive restoration subjects. One such was an un-named, part-completed model designed by none of the late lamented Alan Hawes. Long time RCM&E readers will remember Alan for his Pilot People of AH Models fame. Alan was a mate of mine, and a DMFC Club member, but none of us recognised this particular model. The fuselage was well on the way to be completed, with nicely finished window apertures. Possibly, it was the mule for a new, never released, AH Models kit. Anyways, it had the look of an American light aircraft. Some lads thought it looked like a Maule. However, I reckoned that the fin was upright, and less finessed into the fuselage than a Maule. I thought it might be something like a Whitman Tailwind, but I am no scale expert. When I find out what it is, I will remind you. I think my mate Paul 'Limey' Rice may have bought the makings. I shall keep you informed as to progress.

PRO TECH ULTIMATE

This was the cheapest unopened kit I spotted all day: a Protech flat pack, printed foam Ultimate Biplane. 690mm in span, this was designed as an electric park flyer-cum-indoor model. A nicely boxed item for just £15. Maybe less if you haggled.



RADIOS

No swap meet is complete without secondhand radios. Two or three bargains caught the eye. The first was a boxed brace of trusty Futaba FF6's, including case. Now I happen to have love this model of transmitter. I have had two of these, one on 35 Meg and one 35 Meg PCM, so this was a walk down memory lane. The FF6 was the last Futaba transmitter I bought new and utterly reliable. Two for twenty quid looked a bargain, and you got the ali box too.

Next to catch my eye was a Spektrum DX6i transmitter, a version which I also own. I still fly it with those electric 'bind and fly' ARTF models, which require DSM2. Mine has been very reliable after initial hiccups with a trim control. There were a few examples on sale at 60 quid each. A good workhorse and much better than my heartache 8i.

The final transmitter to sparkle at the swap meet was quite a bit more upmarket. This was an immaculate, boxed, Futaba T14M2P. This came with the benefit of an additional Spektrum module, so it covered most bases. I think the asking price was between £220 - £240. A very attractive proposition for committed Futaba-ites who also have some Spektrum gear.



Cheapest kit: Protech flat pack printed foam Ultimate Biplane of 690mm span.



Going for buttons: a boxed brace of trusty Futaba FF6's. Good radios.



DX6i transmitter, handy for those 'bind and fly' ARTFs that require DSM2.



Immaculate Futaba T14M2P complete with an additional Spektrum module.



Far left: New, boxed and unflown X8 SW 2.4 Gig photo drone. Less than 40 quid.

Left: Budget O.S. copy: Blue Bird .25 glow. Note O.S. 'knock off' NS script.

QUADS

There were quite a few quads, photo quads and FPV racers for sale. I clocked a boxed and unflown X8SW 2.4 Gig photo drone going for £38, so it was hardly dear! It had an unspecified HD camera, but you never know the quality until you see it on your computer monitor. Mind you, 38 English Pounds is pocket money.

O.S. 20 GLOW

I can't resist old engines. I spent much time handling and admiring everything on offer. Naturally, these were all at really encouraging prices. If you wanted to top up your impromptu engine collection, there were quite a few to be ogled. If you just wanted some cheap n' cheerful power plants 'to go', you could fill yer boots! I don't own a classic O.S. 20 so the one on offer, boxed with papers for twenty quid, took some avoiding. There is something delightfully minimal about this era of classic O.S. engines. This one was in good condition and had good compression. It came with an immaculate carb and an undamaged 702 exhaust too. A really appealing and practical old R/C engine - for buttons.



Classic O.S. 20 glow on offer, boxed with papers. Lovely and minimalistic.

BLUE BIRD .25 GLOW

There was a neat Blue Bird NS .25 glow for sale. I bought a Blue Bird .15 many moons ago, when I was young and borderline destitute. Counter-intuitively, seeing this Blue Bird at the swap meet raised a huge wave of nostalgia for those halcyon days of yore. Those times when we sallied forth armed with not much more than hope in our

hearts, plus a can of KK Nitrex 15. Old Blue Birds had the look of a budget O.S. 15, but at a fraction of the price. Even the NS on the crankcase mimicked the beloved O.S. script. Sadly, like the Fuji .15 glow I also bought as an impecunious younger modeller, my particular Bluebird was not a good starter, nor a good runner. I almost bought this .25 for old times' sake, and also because I am partial to twenty-fives. Frankly, I also wondered if I could actually coax some reliable performance from this version.

Thinking of all the un-run engines languishing in my shed, discretion proved the better part of valour. I walked on.

IRVINE FORTY

In my opinion, the red Irvine .40 series were the best mass-market glow engines ever produced in the UK. I have at least three in the .40 - .50 range; powerful engines that all run as sweet as a nut. Paul Marsh (who many readers will recognise from my photos of fly-ins up and down the country) bought one of the red variety on offer.

Mind you, I also spotted a Series One metal finish Irvine .40, complete with trademark triangular boost port. It was on one of the tables, but I never thought to ask the price.



Paul Marsh bagged a nice red Irvine glow engine. Best UK glow ever.



No shed should be without an engine test stand. This one has a remote throttle.

TEST STAND

If you mess with engines, sooner later you will wish to build or buy a test stand. There was an O.S. 25 glow for sale on a nifty home brew test stand. This was 'in haggle' for about twenty quid. It was complete with SLEC tank and clever little remote throttle arrangement. A very useful bit of kit for the shed or the field, at a bargain price.

EXHAUSTS AND PIPES

These days, swap meets are ideal places to track down what used to be expensive engine exotica. Usually at knock down prices. There were many special exhausts, Pitts type in-cowl mufflers and tuned pipes on offer.



Commercial adjustable outlet pancake exhaust for an .09 sized glow.





Beautifully polished NIB Evolution 'Gas Muffler'.

I always trawl such items for the engines I have, but sometimes simply for inspiration. I often buy a commercial example of something I might wish later to fabricate myself on my lathe or milling machine.

A few years ago, in RCME, I published my home-brew DIY adjustable pancake exhaust for the O.S. 40 - 46 AX range. Today, I spotted a tiny commercial .09 sized version going for buttons. I bought it and took it home to examine in my shed, so watch this space.

Also on sale was a beautifully polished NIB Evolution 'Gas Muffler' that went for just twenty quid. Some petrol head is now sitting in his shed reading this, wishing he had dragged himself out of bed last Saturday morning, to drive up here to Wales!

ENGINE PARTS

Always worth a look, there was a treasure trove of engine parts on offer at silly-cheap prices. I was on the lookout for pistons and liner sets for a few duff glow engines in my refurb bay. This time I drew a blank, but in the past, I have often tracked down exactly the part I needed. A wonderful swap meet activity.



Got liners, if you want 'em!

SUPPORT KIT

There were loads of cheap and highly usable chargers on offer. There were brand new boxed classic Ground Support Panels for glow engines, as well as a plethora of meters, glow sticks and clips.

One rather stylish (Tx/Rx) Battery Charger/Discharger caught my attention. This was a Futaba CR-2500. I instantly recognised that it cosmetically matched the classic BR-200 Futaba Battery Checker/



This looks like a piece of consumer audio equipment but is actually a Futaba CR-2500 charger.

Discharger tester unit that lives in my field box. This line of silver Futaba checkers look much more like consumer electronic audio items than pieces of field kit. I remember my CR 200 cost over thirty quid new. Quite lot of dosh at the time for bit of style. This swap meet CR 2500 example was bubbling under ten quid.

RETRACTS

Commercial retracts of quality for heavier models are (correctly) never cheap. There is a lot that goes into their design, materials and execution. Therefore, I was surprised to see an unused, well-branded, tricycle set on offer for less than 150 pounds. These were nicely engineered Century Jet Air items.



Well built, unused Century Jet Air Retracts tricycle set.

WHEELS

Lately I have bought most of my wheels new and unused from swap meets. There were some very nice rubber tyred and metal hubbed wheels on offer, which sorely tempted me. I plan to have yet another go at home made wheel brakes next winter and metal wheels offer one way forward. Especially if you design and fit your own disc brakes. You can source 'experimental' stuff like this for very little dough at swap meets.



There were some very nice rubber tyred and metal hubbed wheels for sale.



Left: Lots of pilot busts, torsos and full lengths were on offer.

Below: This laid-back grey resin glider chappie had loads of detail. 3D printed, perhaps?



PILOTS

At this time of year, with our Winter Projects set for roll-out, many of us are looking for model pilots. DMFC Spring Swap Meet 2020 did not disappoint. They seemed to be available in all sizes, in bust, torso or full length. One table even had brand new individual pilot torsos, pilot limbs and pilot hands in bulk for you to choose and assemble yourself.

Then, on another table, there was a particularly laid-back glider chappie I quite liked. He was made from grey resin and had loads of detail. I think he may have been 3D printed. He was on offer for just a few quid. An inventive bit of airbrushing and he would truly look the business.

FULL DISCLOSURE

Finally, one swap meet item on offer made me smile. It was a crinkled remnant of a roll of covering film, honestly described: "1 metre, slightly manky, with mouse-nibbled edges..."

THE VERDICT

Attendance was down for obvious reasons, but for those of us attending, there were lots of bargains. Most importantly, it was a delightfully agreeable social occasion. We collectively put up two fingers to the current hubbub and got on with our lives.

See you at DMFC Swap Meet II this autumn! ✈️



Lots of boxes of delight through which to rummage.



Half the fun of a swap meet is discovering something intriguing.



There were a fair few good condition wooden ARTFs to consider.

All Write

Get in touch...



Kevin.Crozier@mytimemedia.com

TOP LETTER

BEST OF BOTH

I was interested in Alex Whittaker's comments in April's RCM&E about cyano and his decision to stop using it altogether due to health reasons.

I've always favoured the use of aliphatic glue but am aware that both types of adhesive have their particular advantages. The obvious benefit of using cyano is its speed and the fact that joints can often be made without the use of pins or clamping, but this 'fast grab' can also be a problem if components need to be adjusted or repositioned before the glue holds fast. If you don't get it right first time you may regret it! Aliphatic (and similar) glues have the advantage that they allow time for components to be checked and adjusted, and for this reason I find it's far better than cyano for complex assemblies such as wing structures or balsa sheeting. I believe that aliphatic is better at gap filling and strengthening around joints, so is a more durable option long term. It's also cheaper and has a longer shelf life than cyano, with no obvious health issues. The disadvantage is its longer setting time, which can put some people off, although there are ways to work around this.

Going back to Alex's decision to stop using cyano, I do think he may be missing a trick here. In recent years I've adopted a building technique that allows me to enjoy the benefits of both types of glue. I don't remember exactly where I first got the idea from (it may well



For his letter this month Peter Sandford wins a very popular LiPo and low self-discharge Rx pack combo courtesy of Overlander Batteries - www.overlander.co.uk

have been in the pages of this very magazine), but I haven't seen it mentioned for some time and thought it might be useful to remind fellow aeromodellers. Essentially it involves making a joint using aliphatic as the primary adhesive but leaving a small number (depending on the joint size) of small patches glue-free, onto which a drop of medium cyano is applied just before making the joint. After holding tightly by hand for 30 seconds or so the cyano will have acted as a kind of chemical clamp and hold the joint together, allowing the aliphatic to set in its own time and create the main strength in the bond. In the meantime, work can continue on the airframe (with reasonable care) as the joint can be treated as having set, so there's no further delay.

I also use variations on this technique, which are best summed up as 'use aliphatic glue wherever possible but use cyano where it's of particular advantage'. For example, cyano might be used to bond the inner and outer ribs in a section of wing framework, holding it all together so that the other ribs can then be added using aliphatic glue and the whole assembly then allowed to set fully.

Using cyano sparingly like this will allow you to enjoy its benefits but should avoid the over-exposure that's created health problems for Alex and others.

Peter Sandford

FLU LIKE SYMPTOMS

A couple of days in to building my first 'isolation' project all was going well, but on the third day I just was not feeling up to par - runny nose, headache, classic flu like symptoms. This was not the time for flu like symptoms, so I started racking my brains to try to think if I had come into close contact with anyone from overseas as here in New Zealand we had just 29 positive results for the virus and all had a link to overseas travellers.

With a growing feeling of dread, I pushed the thoughts to the back of my mind and carried on. About this time my latest subscription of RCM&E arrived in the mailbox, a welcome distraction from feeling less than chipper. As always, I flicked through to Alex Whittaker's 'Weekenders' column - always a good read. I turned the page to see the man himself in some sort of spray mask and had a quick read about his cyano allergy! To say the penny dropped was an understatement - it was like Big Ben clanging!!

I too am allergic to cyano and over the last couple of years I had switched to aliphatic resins and epoxy resins, but I had a stash of cyano for those occasions when nothing else would do. And I had been using it over the last few days!

A huge flood of relief washed over me; I hadn't given a thought to my cyano allergy so this time the cyano is in the bin and my Covid scare is over.

Wayne Drinkwater

VISIT MODEL FLYING

Just wanted to say how much I enjoyed the latest issue especially 'The Swinging Sixties' piece. I have been buying RCM&E for around 2 years but have now taken advantage of your subscription offer. I have now started building after a 45-year break; my particular interest is scale models so I've gone down the route of a traditional scratch build from plans for an Auster A4 which I will probably finish as an RAF trainer.

This leads me to the other reason to contact you; when I was young, I couldn't dream of being able to afford even single channel radio gear. I wonder could you run a feature for beginners or returnees to the hobby with recommendations on the type of gear that would be suitable as I for one find it bewildering.

On a final note I would like to compliment you on the quality, content and standard of photography in your magazine, I have written for a number of publications over the years and yours is up there with the very best.

Peter Vivian

Thank you for your kind words, Peter. Several beginners radio articles have been published in RCM&E over the years and no doubt will do so again, but for now why not take a look at the Features section at www.modelflying.co.uk where many such articles are archived, plus articles on other topics too - Kevin

PRESSURE POINT

I have always been a traditional builder. I cover wings with tissue, film or silk. Whatever I use there is one common factor that could become a problem and for which I have a simple fix.

When a wing is covered it becomes a balloon. You may have built it in winter but now you are flying it on a hot summer's day. The air pressure in the wing increases and if the covering is a total seal it may expand it. The reverse is also true; the covering will sag when a wing built in summer is flown on a cold winter's day.

The solution I adopt is to prick a couple of pin holes in the covering where it does not show, usually on the underside near the wingtip. That way pressure changes within the wing can escape to air. I also make a hole through every wing rib to ensure common pressure throughout the wing.

Jeremy Bright

SURVIVALIST MANIFESTO

Owing to various commitments I have not been as active an aeromodeller as I could of late. But the wind blowing in your face on the slope makes me come alive - there really is a certain unfathomable appeal to slope soaring!

A few years back a friend of mine and I joked, after what we felt was a rather successful outing to the South Downs in 30 mph plus winds and with low cloud hugging the slope tops. In retrospect the visibility was pretty poor, but we'd gone there to fly, and the wind was hooning.

We broke into chorus on our trek back down to the car: 'So...have you got your low cloud rating?' and 'Have you got a licence to fly in winds gusting over xyz mph?', and all manner of other 'killjoy' parameters that we could come up with.

So, I had to chuckle when reading Alex Whittaker's 'The Survivalist Manifesto' article in the April issue. It echoes our predictions back then, tongue in cheek as they were, of the impending red tape and unwritten indirect taxation to come.

Rory Reid

WEARING THIN

I do enjoy Alex Whittaker's sagacious and humorous articles in RCM&E and appreciate his mission to include his readers in that mythical clan of industrious shed dwellers. However, in his recent 'Survivalist Manifesto' I began to sense that the humour was wearing somewhat thin and that I was being distanced by what I felt amounted to boasting of his seemingly limitless resources. RCM&E quite rightly allows us to enjoy the aspirational as well as the practical aspects of our hobby, but, perhaps, in order that they do not feel quite so disadvantaged, Alex should have a gentle reminder that for very many of his would-be fellow survivalists the best we can hope for as a shed is a corner of a spare room and that the ability to house a couple of bandsaws or to rustle up some engine spares on our very own lathe is sheer fantasy.

Charles Sutherland

Thank you for your kind and rather perceptive words, which mean a lot to me. I am also grateful for your constructive criticism, which I can see is well meant. It does a scribbler like me no harm to be pulled up by a doughty reader - Alex

GET BUILDING

I have long been a devotee of the wooden kits from Stan Yeo of Phoenix Model Products - a regular advertiser in RCM&E. At the moment this is a godsend because coronavirus restrictions mean that we cannot go out to fly. At least I can spend some of this enforced confinement in the workshop, producing some attractive models, ready to fly, for when the restrictions are relaxed.

Stan tells me that sales of his kits have increased recently and the model on my bench, which I have just started, is Stan's 'Cheerie' small electric sports aeroplane.

So, my advice to others during the current crisis is to buy some traditional wooden kits, which will absorb your interest for many hours and is so much more rewarding than ARTF models.

Geoff Willis

CAA MODEL MARKING



My old Dymo label printer does the job admirably and in upper case mode prints capitals at 4mm height - a tad larger than the CAA minimum requirement. Though possibly overkill for individuals, a club machine would be a cheap and efficient way of banging out labels 'ad nauseum' in a variety of colours, to suit model schemes.

Dave Goodenough

With regard to the CAA registration number, this could cause damage as when you try to remove said number it could wreck any details on the model. My solution is magnetic tape, which is very strong, using a keeper on the inside to hold it in place. For scale guys this is ideal as for static judging it can easily be removed and for flying simply replace it at the dedicated position without any damage at all.

As you can only fly one model at any given time this is the best solution. I have a number of scale models and to apply stickers, which would damage the scale detail, would not be acceptable. I simply change the magnetic tape from one model to another.

The magnetic tape and the printing can be obtained from any sign and graphic company. Said tape will not blow off as long as the keeper is in the correct place behind the tape. I have had this tested on a pulse jet and it stayed in place in a dive from approximately 3,000 feet!

Dave Horton

POLYMORPH PLASTIC

Reading this excellent magazine for many years, I have read many articles with interest but cannot remember any mention of a material called Polymorph.

Polymorph is a plastic material, which comes in granular form and congeals when placed in boiling water and is pliable until it cools. At this point it becomes solid, with a nylon texture, which is able to be drilled. It can be returned to its pliable state again by immersing it in boiling water.

Obvious safety factors apply because of the use of boiling water but the only other restrictions on its use is the heat factor in the place of use, the strength required and the ability of the user.

I hope this is of interest to some.

Richard Leeper

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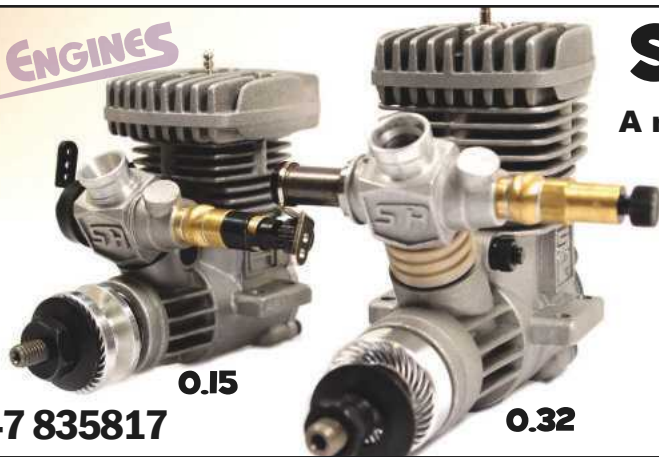


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Tangent know how to make robust models for scale sport flying. This ASG-29 is stunning.



CONDOR MOMENT

Simon Cocker looks back at a range of popular Multiplex semi-scale and sport gliders - and shows where you can get one now! words & photos » Simon Cocker

I acquired a newly completed Multiplex Condor last year, lovingly brought to life out of its antique box by Keith Thomas, a gentleman who quietly frequents the Long Mynd and who I have known through his magazine contributions back in the days of Quiet Flight International.

The Condor is 4.2m span and a sturdy Alpine design, which has a similar soaring pedigree as the ubiquitous Alpina, originally released in 1993. If you Google search Multiplex Condor you will be directed to many photos of the type but the one example that stood out was an unusual burgundy coloured version with yellow tips, which resonated in my mind with a tinge of familiarity. I opened the link to find an old article I had written for RCM&E in 2006 and to find it was a younger version of me posing with the model on top of Bosley Cloud. Ironically, I mentioned that I had previously owned two Condors and regretted selling them, which clearly was a mistake that I had



MPX Condor just before the coronavirus took over. I love flying this old bird.



That special Condor moment was brought along by MPX in 1993 and she can still outperform more modern ships on the right day.

unknowingly and subliminally rectified with this latest acquisition/swap!

I referred to the Condor as quite a heavy model in the article, which it is compared to the Alpina. It is a little heavier duty and much more robust. Today, however, the airframe, with its higher wing loading is no big deal and it is certainly regarded as an advantage to cope with those bigger wind days.

Provided the Condor is set free to ride the sky at its chosen airspeed then its soaring efficiency is wonderful and thermal hunting potential is as capable as the more modern moulded machines much of the time. Working the flight arena on Bosley Cloud in search of thermal augmented lift becomes a relaxing and joyful task, knowing that the Condor will indicate clearly when it intercepts the magic flavoured ascending air. A bump or a nudge from a thermal pocket offers a tell-tale sign that a bigger lift zone is within grasp and a turn is made in that direction until the Condor is centred and pivoting on its wing tip, around and around, clambering its way forever upwards.

The Condor has a full span four surface trailing edge and I always combine the flaps to the ailerons with a 65% mix to augment the power of roll commands. The rate switches are used in addition to provide the option to enjoy the full 125% movement of the trailing edge for ultra crisp rolling manoeuvres or return to 50% for smooth relaxed soaring. Exponential is used in both phases at 35% and 20% respectively to even out the feedback and to provide a smoother feel.

FIXER UPPER

Rare opportunities occasionally present themselves to purchase some of these older Multiplex models if you keep an eye on the internet selling outlets such as the BMFA classifieds, where I found an ancient and battered DG-300 fixer upper. In their day these were the pinnacle of the sailplane scene, imbued with a stunningly envious flight performance and at 1:4 scale they were considered a large, chunky model.

How the world has moved on since the 80s, leaving this era of modelling technology in the dark ages. Having flown another example of the DG-300 that I refurbished many years ago, I know for certain that despite its antiquity the model's potent

performance still has its place and value to this day, particularly in light breeze and thermal conditions. There are occasions where the risk of not connecting to sustainable lift prevents the launch of a 6m sailplane with a value of £3K and I will often hold back, electing to wait for a sturdier lift period later in the day. Occasionally this does not materialise, and the afternoon slips away without daring to fly, which is ultra-frustrating. The MPX DG-300, or their lovely DG-500 - an even rarer ship - are the ideal craft to revel in these niche weather conditions. If you are extremely lucky you may even find an all moulded version of the MPX DG-300, which I had assumed was just a myth, but limited numbers were produced



MPX DG-300 fixer upper before entering the workshop and having a full work over.



I enjoy a worthy subject for refurbishment. The DG300 from MPX returns an astoundingly fun and capable performance.



MPX rare bird indeed. A DG-500 in perfect, original condition, proudly owned and flown by Simon Marsden.



Simon's DG-500 golden oldie gets away on the Mynd. Soft to fly but so useful in lighter conditions and ever so pretty.



Krause Modellbau: what happened to them, I often wonder? Grab a kit when they come up second hand.



“It is the most rewarding feeling to be equipped with the right model for every flavour of breeze and thermal variation...”

Wik Astir 77 is another 80s moulded model. They still appear in attic sales. Superb soarers - if you can pinch one in time!

and I have the remnants of a friend's model, lost in a tailplane detachment incident, to prove their very existence.

It is the most rewarding feeling to be equipped with the right model for every flavour of breeze and thermal variation, particularly when you can share the experience with your flying buddies who are looking on in frustration, having brought the wrong selection of models.

ON A TANGENT

The last MPX semi scale sailplane to be produced was their ASH-26 at 4.0m span, which again was beautifully designed and produced a glider that sold in huge numbers. Then, if you recall, Multiplex discontinued all of these stunning sailplanes when they opted to pursue their Elapor range of models and their new partnership with Hitec.

It was not commonly known that these kits were being produced for MPX by a company called Tangent-Modelltechnik, who kept a low profile behind the

internationally renowned MPX banner. Their influence became a little more obvious in the closing stages of this long collaboration, when the ASH-26 was offered with a considerably beefed up wing structure. Having owned a couple of these models with the standard wing layouts, I can vouch for the need for this more capable version as I frequently encountered aileron flutter before reducing my performance expectations.

Tangent have continued to mass produce their range of high-performance models ever since. They have established a huge market share in a niche arena where all moulded models seem to be sought after beyond all else. However, Tangent's reputation for extreme quality and strength using a carbon reinforced foam and wooden based wing structure prevails.

Their exacting manufacturing processes are legendary and their USP is the performance relative to cost - it cannot be beaten.

One of the many advantages of moulded wings is that the surface finish replicates its full-size counterpart and, of course, it remains perfect in normal use. Film covered wings require ongoing maintenance to keep them pristine and unless perfectly applied to the right surface in the first instance film will always look like a cheaper facsimile. Tangent addressed this issue and started covering their wings in top-quality self-adhesive vinyl some years ago. The wing skins are epoxy bonded and rock hard. The veneers are prepared to such a high standard that the surface finish accepts the factory fitted vinyl without any evidence of the obechi grain showing through the material. A clever further feature is the use



Tangent's ASG-29 in FES and SLS versions. 1,800 Euros is a very fair price these days.



ASG-29 is so beautiful as all the proportions are designed in perfect harmony. Half the price of a top-quality moulded version too.



Tangent's 5m span ASH-26 is a perfect all-round top performer, but it needs a FES to complete the package.



Left: Ben and Karen Avery on Bosley Cloud with their Alpina Magic (left), which flies like a dream.

Below: Tangent's USP is their price to performance ratio. Quality is right up there too. An awesome range of models, not to be overlooked.



Above left: ASH-26 kits from MPX are excellent but the Tangent version is the one to have for double the strength in the wings for aerobatics. Bag an oldie though if you see an MPX version for light wind days. Left: Tangent's full carbon skinned edition is a proper wing structure. I would be happy with all that strength in my ASG-29!

of their own ink jet printer to decorate the vinyl with graphics before the surfaces are covered on their range of sport models. There are a variety of stunning and multi coloured schemes to choose from in their standard range, or you can arrange your own unique one-off example to stand out from the crowd. The outcome is the look and feel of a moulded wing for a fraction of the cost.

Performance is what we all crave, and this factor is the reward in most cases for our huge investment in an airframe. But at Tangent you can buy all of that without needing a second mortgage. Equally as

important, and again unique to this company, is the facility to buy replacement parts that will match your existing airframe, such as the precise tolerances invested in their manufacturing process. Parts are practically as accurate as a fully moulded airframe but without that inherent cost. And they are much easier to repair, being made with materials that we can work with ourselves.

On their website (flugplatz.tangent-modelltechnik.com) Tangent currently offer stock of their old faithful models in the 3 to 4.4m span range such as the Alpina, Flamingo, ASH-26, Kult and Vortex. Their impressive 4.5

to 5m range includes a gorgeous ASH-26, Alpina, Nimbus 4 and an ASH-31Mi. The 6m span ASG-29 is the flagship and I hear from Paul Bartlett, who built and flies this type, that it is a stunning performer and it loves a thorough ringing out.

There are four types of wing lay-up on offer, depending on the type of flying you intend to subject the airframe to. I believe you can also custom order your specific needs for a particular model type. There is a page on their web site which illustrates the content and distribution of carbon and carbon cloth skinning under the veneers.



Sport Klemm's mitt design is perfect for all sizes of Tx and there's room even for finger and thumb twiddlers!



A bottom zip enables a stiffener panel to slide in and support the Tx.



Zipped breather vent keeps the air circulating in warmer conditions.

45-degree weave is used exclusively for torsional rigidity, which is known to offer dramatically increased strength compared to conventional woven carbon cloth.

The lightest lay-up, known as the Thermik-Edition, could be employed for the 4m Alpina as a pure soarer for mild aerobatics. The Full-Carbon Edition requires considerably more investment but is worth the trouble, especially for the 5m ASH-26, with a high-power FES, which could then be used for high energy aerobatic fun.

Then there are two middle options, with differing carbon D-Box lay-ups. Advice can be taken from the Tangent team, who will make the right choice for the size of model and your performance aspirations. The cost will, of course, help influence your final decision as there is little point in over specifying an aircraft type as the additional weight will only be a hindrance.

The 'Carbon Editions' page lists the lay-ups compared to their standard pricing. For example, the ASH-31 Mi may be equipped with the Carbon Champ lay-up which provides a mostly carbon D-Box that feathers out at 80% span. This 4.5m span airframe costs 1050 Euros while their 4m span ASH-26 with the Carbon Master Edition costs 1000 euros. The Alpina 4001 Lite at 4m span is 900 Euros, to give you a clue to the current price points.

WEATHER STATION PROTECTOR

Writing this in early Spring, temperatures have dropped to the seasonal norm or below, which may be too cold to appeal to many slope flyers to venture out there, bearing in mind the wind chill that comes with this essential form of energy. With the appropriate thermal clothing most

radical weather challenges can be combated these days if you are determined enough to stand on the windswept moors. Getting older seems to have served to dissolve my resolve but then suddenly out of the blue a beautiful crisp sunny day can present itself to persuade me otherwise. Due to the British cold I have begun using a transmitter mitt that I bought from Sport-Klemm.de, which provides protection from cold winds and damp ingress, or even rain showers. This 'Wettersenderschutz' (item ref 1081) costs 98 Euros.

The Klemm weather protector is designed to comfortably accommodate tray style transmitters, with room for gloved hands and it also allows speedy access for the launching part of the flight. This is a comprehensively rugged and versatile design with longevity built in, which justifies the price tag. The combination of thin gloved hands inside the mitt provides a huge advantage, giving protection from wind chill and it dramatically increases the exposure time to the elements on those really bitter days.

There is also space to line the insides with thin foam. Neatly zipped individual pockets are installed all around the inside to accommodate thin foam boards that act as a stiffener and for added insulation. When all the sleeves are fitted with Depron (the intended material for this function), then the shape of the unit remains fully supported. I have also wondered about using a couple of warming devices to boost comfort on the hands in there too - every little helps!

A neat breather section on the front upper section can be unzipped to allow air circulation when conditions are not too

cold and prevents clammy hands and condensation from forming on the inside face of the clear plastic top screen. There is ample space around the sides, even when using a tray style transmitter, to freely move your hands. Also important are the options to alter the depth of the transmitter protector so that there is ample space provided above the gimbals for those who prefer finger and thumb control. The main opening of the unit has a variable tier Velcro panel to govern the depth as you prefer.

I am a thumb twiddler so my hands are used to holding the outer edges of the transmitter and are out of the way vertically. But there is adequate sideways space provided whilst using my Jeti DS16. I have a couple of smaller transmitter protection products that are simply too tight and compact, so my hands and their operation of the controls are hampered, which has been frustrating and uncomfortable.

Two adjustable straps are provided; the main one supports the weight of the whole unit and a secondary support wraps around your waist to prevent the Tx from swinging around your body when you self-launch. The main support is comfortable and fits around the back of the neck, thanks to the wide material and the addition of a rubber load spreader. I normally use a full Jeti shoulder strap, however I was surprised that I immediately felt at ease with this alternative support design. For thumb and finger stick twiddlers I would suggest installing a stiffer foam panel in the zipped base pocket to provide the necessary support and rigidity. I used 3mm Depron so there is some flexibility for my fingers to grab the undersides of the Tx. ✈



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P-51 MUSTANG

Hot on the heels of their micro Cub, SonikRC have released this sweet little mustang. David Ashby heads for the park
words & photos » David Ashby

Recently, I looked at SonikRC's little micro Cub and now it's the turn of this P-51 Mustang, also a new release. It shares the Cub's DNA. Actually, that's not true; it's a little smaller in span but otherwise uses the same power system and transmitter - so you may know what to expect.

It's made from moulded EPO foam, painted and factory fitted with a power system and radio gear. The little transmitter (Tx) supplied should be pre-bound with just battery charging separating you from your first flight.

Like the Cub it comes with everything you need - a 1S LiPo cell, USB charger, clip-on wheels and a spare prop, plus a good little manual too. There's a built-in gyro that adds auto-stabilisation and a Tx switch that activates three flight modes: Expert (gyro off), Midd and Beginner.

SET UP

It's a pretty little thing. Sure, the fuselage is a little pudgy, but it's obviously a P-51 and looks good in the air, which is all that matters. Four channels fly it with a combined

ESC/Rx, with two servos in the fuselage (for elevator and rudder) and a servo on the underside of the wing pushing the ailerons. At first glance that aileron servo looks a little exposed, especially if, like me, you intend dispensing with the wheels. In practice the model carries little inertia so there's nothing to worry about beyond a cursory inspection after landing.

The manual needs to be read so you're familiar with the modes, throttle arming procedures, button-press aerobatics and the return command. Don't worry about the C of G - pop the battery under the hatch and that's all sorted.

AND AWAY...

A simple underarm launch is all that's needed. The first aspect to impress was just how much thrust the geared brushed motor and prop manage to extract from the power provided by a single LiPo cell. It flies like a 2S model. That gearbox makes a better sound than the usual brushless noise, too.

The gyro works well to keep the wings level and hold the model's course. For

experienced pilots there's no shame in using Midd mode as the stability is impressive and a gentle breeze won't worry the model. In fact, when the wind blows things get a bit uncomfortable 'gyro off', where this 54g warbird will get pushed around a bit.

That gyro doesn't feel too intrusive in Midd mode, although those less experienced will turn to Beginner mode where the gyro exerts a slightly stronger self-levelling force.

It's a micro size model so how does it fly indoors? If you fly in a small hall then the model is probably best left at home. It's just too fast for very small spaces. In larger halls it moves comparatively fast; faster than, say, E-flite's Spacewalker or one the WW1 biplanes from Ares, making it one for confident pilots only.

PARK BIRD

The park is its natural home, where my best flights have come during early morning sorties. It's a sweet little thing to fly when it's calm; you can steer it round with low passes, barrel rolls and wingovers in true



Everything you need is bundled, including a spare prop.



The aileron servo seems exposed at first glance but is fine tucked away on the underside.



Neat Rx board houses the two tail servos.



It's a snug battery bay.



That's a Walkera type plug.

“Everything you need is in the box and relative beginners through to experts will love it.”

USB charge lead and 1S 360mAh LiPo battery.

Right: This aerobatics feature is a bit gimmicky. Grab a height margin before you try it.
Below right: The modes (gyro assist) work well. Use 'Midd' if a breeze is detected.



Those Tx sticks feel fine in use.

warbird style. Even then, stability in Midd mode is discernible and it's impressive to see how well the heading is held.

Gyro off, the roll rate is very sluggish, so have plenty of height in the bag before you try one for the first time. Gyro on, forget it, that's not going to happen. Loops are straightforward.

Landing is just a case of bleeding off power before flaring and in Midd mode you can slow it up and hang on elevator without worrying about dropping a wing. In fact, gyro or not, this is a model that's practically unstallable. The notably under-cambered wing combined with the model's low mass no doubt helps in this respect.

Obviously, the Tx bundled with it can't hide its price point, but the sticks are better than you'd expect and provide the intuitive flyer/model 'feel' required.



Warbird passes look great. Few flyers will fit the wheels.





Thanks to the gyro it flies like a bigger model.



DATAFILE

Name:	P-51 Mustang
Model type:	Ready-to-fly micro park flyer
Manufactured by:	SonikRC
UK distributor:	J.Perkins Distribution jperkins.com
RRP:	£81.99
Wingspan:	400mm
Length:	325mm
All-up weight:	54g
Functions:	Ailerons, rudder, elevator, throttle
Power system:	Geared brushed motor, 5.1" x 2.75" prop, 1S 360mAh LiPo battery
Supplied with:	2.4GHz transmitter, USB charger/lead, spare prop, 1S 360mAh LiPo battery

Above left: The little screwdriver included is for spinner removal to access the clip-on prop. Left: Although the Tx has trim pushers, push rod arc adjustments can be made too.

FINE BIRD

Go back a few years and the model trade was riding the ultra-micro model wave with a plethora of new releases. But we've seen very little over the last few years, which makes this P-51 a welcome arrival. Everything you need is in the box and relative beginners through to experts will love it.

Duration should come in at a decent five minutes or so, and if you should inflict some sort of damage then be reassured as the UK distributor sells spares through model shops. ✈



Looks like a Mustang to me. Pretty, eh?

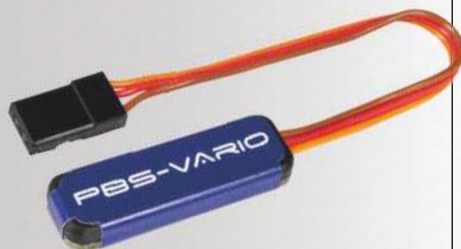
COUNTERPOINT



40mm SEARCHLIGHT

€109.9 | www.unilight.at

The largest in their range of quality searchlights, Unilight's SRC40 is equipped with a 40mm reflector that provides a high intensity 100° beam – perfect for a scale Search & Rescue or Police helicopter! Made from CNC machined aluminium the unit measures 40mm x 21mm, weighs 2.8oz (80g) and is supplied with mounting brackets fitted with scratch-free nylon bearings. Available in white (900lm) and warm white (800lm).



PBS-VARIO

€79 | www.powerbox-systems.com

An extremely precise climb rate and altitude sensor for use with PowerBox CORE, Jeti EXBUS and Futaba S.BUS2 telemetry systems, the PBS-Vario from PowerBox Systems is capable of accurately measuring differences in height to within 0.1m accuracy thanks to a digital filter that ensures the measured values are completely devoid of noise and distortion. In addition to the climb rate (in m/s) the PBS-Vario also measures the relative altitude (from the launch point) and the temperature at the sensor. With an operating voltage range of 4 - 9V, power-on current drain is 20mA max. Measuring just 40 x 10 x 4mm and weighing just 0.2oz (6g), the unit can find a home even in the smallest gliders.



VQ P-51B MUSTANG

£169.95 | www.macgregor.co.uk

Sporting a highly detailed weathered finish this 60" (1524mm) VQ Models ARTF from MacGregor is an ideal route into scale model ownership without committing to a long-term building project. A delightful facsimile of the P-51B 'Berlin Express' flown by WWII USAF fighter pilot Bruce 'Bill' Overstreet Jr. the model features a laser-cut, jig-built balsa and lite-ply airframe, factory installed control surfaces (including flaps), fibreglass cowl, hand-painted pilot, wheels, decals and hardware. A fixed u/c is supplied, with electric retracts available separately for £84.95. For a .40 - .46 two-stroke, .70 four-stroke or electric equivalent (Electrospeed 5055/06 580kV outrunner, 80A ESC, 4S 4000mAh LiPo recommended), 6-channel R/C and 6 - 7 servos are required.

POWERBOX PIONEER

€199 | www.powerbox-systems.com

Designed for use with HV servos this compact (63 x 44 x 12mm), lightweight 1.4oz (40g) 14-channel power supply from PowerBox Systems is a high-performance battery backer with redundancy protection (duplicated output stage and switch controller) for a model's power electronics. With an operating voltage range of 4 - 9V powered by 2S LiPo/Lilon, 2S LiFePo or 5S NiCad/NiMH, the unit has a maximum load current of 2 x 10A (continuous) and is supported by PowerBox, Jeti and Futaba R/C systems. PowerBox and Jeti users can set up the Pioneer from the Tx, whilst Futaba pilots can set it up using the Bluecom adapter and smartphone app or use a PC in conjunction with the USB interface. The Pioneer also features integrated iGyro technology which, in conjunction with the optional iGyro Sat sensor unit, brings an easy-to-setup 9-axis gyro to the party that allows stick priority, lock-in feel and gyro characteristics to be adjusted for each axis across nine independent gyro outputs: 3 x aileron, 3 x elevator, 3 x rudder. Check out the PowerBox website for the full feature list of this versatile piece of kit.



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GOING PLACES

Diary dates for the coming season

MAY 2020

May 23 Dorset Model Aeroplane Spring Swapmeet at Charlton Marshall Village Hall, Green Close, Charlton Marshall, DT11 9PF. All under cover. Mainly model aeroplanes, there may be some cars, boats and trains. Main hall at ground floor however there is an available upper level. Traders from 8.30am at £7 inc. one table and one free entrance. Buyers entry at 9am for £4. Café and free car park plus street parking. Contact John Bainbridge on 01258 458749 or 07864 297226.

May 23-24 Greenacres May Fly-in, Aldridge Airport, off Bosty Lane, Aldridge near Walsall, West Midlands, WS9 0QQ. Campers and caravans can arrive after 1pm on the Friday before. Water, raffle and catering are all available, for a small donation. Visiting pilots fly for £5 per day, but spectators and the public are free! If you have any special requests or requirements please contact Jim Mchugh at jim.mchugh@greenacresmac.co.uk, see www.greenacresmac.co.uk or www.facebook.com/GreenacresMAC

May 24 GBRCAA F3A National League competition, Hurley, Warwickshire. (This is designated as a BMFA Team Selection (P21) and BMFA Open Competition). All schedules. See gbrcaa.org - 'Competition Entry Form' for fees and payment and 'forum' 'Competition News' for details. Visitors welcome but please contact Contest Director, Adrian Harrison on 07976 244004 for further details.

May 29 We Fly Indoors, at the Weatherly Centre, Eagle Farm Road, Biggleswade, Bedfordshire, SG18 8JH. From 6.30pm till 10pm, doors open at 6.15pm. Free Flight - Hangar Rat, GYminnie, Easy Bee or similar. Electric Fixed Wing - Vapor, Lightweight - Slo Fly style. Heli's - MSR style etc. max rotor 410mm, quads max overall 200mm diagonal. Shockies - 500mm max size. All models at organiser's discretion. Flying in approx 10-15 minute sessions, BMFA insurance to be shown. Admission £5, spectators 50p; includes tea/coffee and biscuits. Good access from north and south on A1, venue is next to Stratton Upper School, good parking by venue. Queries to Andrew on 07974 800463 or email andrewleftwich@virginmedia.com

May 30-31 Hastings MFC Spring Fly-in and Swapmeet. Open to all BMFA and LMA members. For a longer stay, camp and fly on our site off the A259 at Middle Bridge near Pevensy from 27th May to 3rd June, £10 for the week (subject to ground conditions). To fly pilots must have min A-cert and B-cert for models over 7kg and turbines. Free open air swapmeet on the Sunday. Bring your own table. To book camping or Swapmeet phone Kevin on 01323 849032. All other inquiries phone Bob on 01892 852137.

May 31 Wrexham Model Aircraft Club Retro and Clubman Sunday. Nearest postcode is LL21 9NP - just off Wrexham to Ruthin Rd at the top of Nanty Garth. Something for the average flyer. Nothing over 10cc or 4S, nothing over 7kg. Vintage, Wot 4s, own-design, foamies, scale - all welcome. Best big sky site in the country with well-kept grass and plenty of it. No A-Cert, no problem but flyers must be competent and proof of BMFA membership is essential. All models must carry correct CAA marking. Just £5 for the day. Flying from 8 till 8. Good toilets. More details from bob.davis.design@gmail.com or call 01490 413276. Expert flyers with bigger models might like to check out the Club's Open Weekend on August 1st & 2nd.

May 31 UK Classic Aerobatic Association (UKCAA) Fly-in at Worcester MFC. Fly-in with round 1 contest to Pick5, Pick7 and 1979 rules during the lunch break. BBQ will be laid on. Visitors welcome but pre-registration is required at ukcaa.org.uk/events. Contact Martyn Kinder on 079890 25198 or email ukcaa2013@gmail.com.

NOTICE:

The Coronavirus situation has led to the cancellation of many Spring and early-Summer events. Those listed are for which a cancellation notice hasn't been received from the organisers although, needless to say, please check before setting out.

JUNE 2020

June 6-7 Teesside Model Airshow and Swapmeet at Drovers Lane, near Redmarshall, Stockton on Tees, TS21 1BD. Airfield signposted from the A66, TS21 1BD. From 10am till 5pm. Just £5 to enter, under 16s free. This year, Teesside Model Flying Club have managed to attract some of the best model flyers in the UK. At the show you will see WW1 and WW2 aircraft and modern jets as well as Team Renegade and AZ aerospots. With the Serpent jet display team, we have also managed to get some of the very best aerobatic pilots, and just for a change from R/C flying we have UK control line combat fliers showing their skills. Camping available but please book early. For more info visit tmfc.bmfa.org/airshow.

June 7 GBRCAA F3A National League competition Ashbourne, Derbyshire. All schedules. See gbrcaa.org 'Competition Entry Form' for fees and payment and forum 'Competition News' for details. Visitors welcome but please contact Contest Director Adrian Harrison on 07976 244004 for details before travelling.

June 7 Wessex Soaring Association Slope Fly-in, first Saturday or Sunday of the month. Various slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers permitted. All welcome but must have BMFA insurance. Contact Pete Carpenter for more details, email pete.carpenter12@gmail.com or call 07919 903742.

June 13-14 PSSA Sabre Mass Build Event at The Great Orme, Llandudno, North Wales. Meet at the Tank Track car park for pilots briefing 10am each day. Silent flight only - no electric power. Proof of BMFA insurance (or equivalent) required. Saturday 13th June will be the planned Sabre competition day. Sunday 14th will be used as back-up for weather. Fly for Fun both days. For more information contact Phil Cooke on 07772 224719 or email webmaster@pssaonline.co.uk

June 21 Classic Gliders meeting at the Hole of Horcum, North York Moors. Bring along your traditionally built glider for a relaxing day flying one of those designs from the past. Evidence of DMARES Operator ID required. Entry £5 per flyer if not already a NYMRSC member. Further details Michael Kitchen on 01347 810685, or email michaelkitchen@me.com

June 21-22 Windermere Model Waterplane Flyers Ullswater Splash-in. Waterside House Campsite, Howtown, Penrith. From 10am to 4pm each day. WMMF members £1 per day. Non-members £3 per day. Proof of BMFA or SAA insurance req'd. Pilots to have min of a BMFA 'A' cert or SAA Bronze. Car parking to be paid at shop at campsite entrance. Further details on windermere-modelwaterplane-flyers.co.uk, call 07775 506842 or email andrew@windermere-modelwaterplane-flyers.co.uk

June 27 Blackpool & Fylde Radio Controlled Model Society Fly-in (sponsored by BMFA NW) at the club field, Singleton Road, Weeton. PR4 3NB. From 10am till 5pm. Come and join us for a great day out. Superb 130 x 60m grass strip with BBQ & music. All welcome inc. jets. Free car park. BMFA Insurance is required and a minimum A-certificate or B-certificate for jets. All LMA flyers welcome with LMA proficiency certificate. For further details contact David Kirkbride on 07872 108297 or email david_kirkbride@btinternet.com

June 27 GBRCAA F3A National League competition Knettishall, 12 miles NE of Bury St Edmunds, Suffolk. All schedules. See gbrcaa.org 'Competition Entry Form' for fees and payment and 'forum' 'Competition News' for details. Visitors welcome but please contact Contest Director, Peter Jenkins on 07725 314950 for details before travelling.



For more events go to modelflying.co.uk

June 27 - 28 Wings & Wheels RC Model Spectacular at North Weald Airfield, Essex. A superb R/C model extravaganza, which includes R/C scale, sport, jet, helicopter, ducted thrust, model air display, model boat, model car, model truck, model train, model plane, model ship, model house, model garden, model farm, model village, model town, model castle, model fort, model bridge, model gate, model fence, model wall, model path, model road, model river, model lake, model sea, model sky, model earth, model sun, model moon, model stars, model planets, model galaxies, model universe. **POSTPONED UNTIL 26 - 27 JUNE 2021** Large trade presence, Saturday night flying displays, live model boats, Bring and Buy, live evening entertainment. See www.wingsnwheels.net for details.

June 27 - 28 Greenacres June Fly-in, Aldridge Airport, off Bosty Lane, Aldridge near Walsall, West Midlands, WS9 0QQ. Campers and caravans can arrive after 1pm on the Friday before. Water, raffle and catering are all available, for a small donation. Visiting pilots fly for £5 per day, but spectators and the public are free! If you have any special requests or requirements, please contact Jim Mchugh at jim.mchugh@greenacresmac.co.uk, see www.greenacresmac.co.uk or www.facebook.com/GreenacresMAC

June 28 UK Classic Aerobatic Association (UKCAA) Fly-in at Royston MFC. Fly-in with round 1 contest to Pick5, Pick7 and 1979 rules. This is an active light aircraft airfield so there may be some minor disturbances to deal with during occasional aircraft movements. On-site catering (closes 1pm). Visitors welcome but pre-registration is required at ukcaa.org.uk/events. Contact Martyn Kinder on 079890 25198 or email ukcaa2013@gmail.com.

JULY 2020

July 4 Fun Flying at Chigwell School Sports Hall, High Road, Chigwell, London, IG7 6QF. For small models, all types, maximum wingspan 20". Flyers £10, spectators £2. For details contact Mike Quille on 0208 500 3549 or email mp.quille@live.co.uk.

July 5 Cocklebarrow Vintage R/C Fly-in. Signposted from Aldsworth Glos. off the B4425 between Cirencester/Burford and off the A40 between Northleach and Burford (follow SAM 35 signs). All types of R/C up to 1975, sport flying, no competitions. BMFA insurance essential. Contact Tony Tomlin on 02086 413505 or email pjt2.altz@btinternet.com.

July 5 Wessex Soaring Association Slope Fly-In, first Saturday or Sunday of the month. Various slopes approx. 5 miles east of Shaftesbury. Non-powered gliders and e-soarers permitted. All welcome but must have BMFA insurance. Contact Pete Carpenter for more details, email pete.carpenter12@gmail.com or call 07919 903742.

July 10-12 UK World Cup league competition. FAI Schedules - International entry. This is also a BMFA Team Selection competition to be held at Woodchurch Airfield near Ashford, Kent. Visitors very welcome. Please contact Contest Director Kevin Caton on 07805 347627 for details.

July 11-12 PSSA Fly for Fun event with the Lley MAC, Nr Abersoch, North Wales. Meet at the Londis car park in Llanbedrog for 10am each day. Proof of BMFA insurance (or equivalent) required. £3 per pilot/day on certain slopes. For more information contact Phil Cooke on 07772 224719 or email webmaster@pssaonline.co.uk

July 12 Open Fun Fly and Avicraft Day at Bickley MFC's flying field, Church Road, Sutton at Hone, Kent, DA4 9EX. This open event has been running for many years and the sixth year it will have been sponsored by the London Area BMFA. The day consists of light-hearted flying competitions that can be entered with virtually any model. There will be many prizes (about 25) which are wrapped modelling goods. Winning the competition does

not mean you get the best prize; you get first choice of the mystery prizes. There will be a free BBQ around lunchtime. Toilets on site. Free access to food facilities at the gun club down the lane. The day is free to any member of any London Area BMFA club or £5 to others. Details at bickleymfc.org/events, or contact John Veasey on 01474 852015.

July 19 UK Classic Aerobatic Association (UKCAA) Steve Dunning Memorial Day at Retford MFC. No contest, but awards (for members) for Pilot's Pilot and Concourse d'Elegance. Visitors welcome but pre-registration is required at ukcaa.org.uk/events. Contact Martyn Kinder on 079890 25198 or email ukcaa2013@gmail.com.

July 19 PSS Fun Flying Day at the Hole of Horcum, North York Moors. Any model accepted, but aircraft built using traditional materials of particular interest. Evidence of DMARES Operator ID required. Entry £5 per flyer if not already a NYMRSC member. Further details from Michael Kitchen on 01347 810685 or email michaelkitchen@me.com.

July 25 - 26 Hastings MFC Summer Fly-in, Swapmeet and Scale Competition. Open to all BMFA and LMA members. For a longer stay, camp and fly on our site off the A259 at Middle Bridge near Pevensey from 22nd to 29th, £10 for the week (subject to ground conditions). To fly pilots must have min. A-cert, and a B-cert for models over 7kg and Turbines. South East Area BMFA Scale competition on the Sunday. Scratch/kit built and ARTF classes. Free open air Swapmeet on the Sunday. Bring your own table. To book camping or swapmeet phone Kevin on 01323 849032. All other inquiries phone Bob on 01892 852137.

July 25 - 26 ModelAir Scale Weekend at Old Warden Aerodrome, near Biggleswade SG18 9EP. For lovers of model flying, pilots and spectators alike, ModelAir Scale Weekend offers the chance to enjoy radio control (10kg max weight & B-Cert), free flight, and control line flying on one site. All pilots must show BMFA Insurance. Various scale model competitions on Sunday, including Flight Director's Trophy for best model of an aircraft in The Collection. Gates open 9am. Flying 10am-6pm. For more information: www.modelair.info & www.facebook.com/ModelairAtOldWarden or contact Sheila 07799 132999. Please note that currently Shuttleworth plans to go ahead with all their events unless advised otherwise by government guidelines. Please check before travelling.

July 26 GBRCAA F3A National League competition, Leicester. All schedules. (This is designated as a BMFA Team Selection (P21) and BMFA Open Competition). See gbrcaa.org/CompetitionEntryForm for fees and payment and 'forum' 'Competition News' for details. Visitors welcome but please contact Contest Director, Chris Bond 07811 196418 for details before travelling.

AUGUST 2020

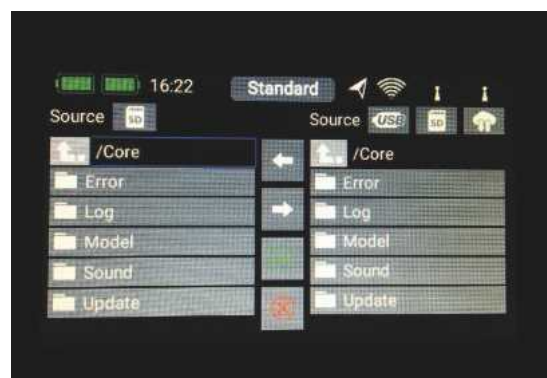
August 1-2 Wrexham Model Aircraft Club Big Summer Fly-in. The best big sky site in the country with 25-mile views to the North Wales coast and beyond. Well-kept grass and plenty of it. Good toilets. Everyone catered for from novice to expert. Pilots must be BMFA and bring their documentation, all models must display the correct CAA registration mark. £5 per day to fly. Camping £8 and caravans £10 for weekend (from Friday lunchtime). Nearest post code is LL21 9NP. For detailed directions, updates or any other enquiries phone Kez Taylor on 0782 4379462 or email keztaylor100@gmail.com

PROGRAMMING THE CORE

Following on from his overview of Powerbox's Core radio earlier this year, the Editor finally gets around to setting up his first model with the transmitter. words & photos » Kevin Crozier



Lifting the panel just below the power switch gives access to the USB and charging ports.



This screen can be used to download updates from a USB stick. Data can be uploaded too, useful for saving back-ups of model memories.



Voice commands are entered here. But make sure voice files are actually downloaded before pressing the play button or your Core will be mute!

Writing this during the lockdown it seems difficult to imagine that just a few short weeks ago, when we were still able to go flying, that flying fields were extremely wet and boggy. Due to the prevailing muddy conditions I thought I would treat myself to one of those tundra style models with huge wheels to make sure that I could still fly no matter how bad things got. And being equipped with flaps it would be a great practice aeroplane with which to learn the ropes of setting up a four servo wing with my new Powerbox Core radio before taking the plunge and setting up the multi control surface wing on the Infinity Evo moulded glider that this radio is ultimately destined to control.

However, my best laid plans went up in smoke when I spotted that said 'bigfoot' aeroplane had already been reviewed in this magazine a couple of years back, which left me casting around for another similarly equipped quad servo winged model to review and with which to practice

my Core set up skills. Enter Ripmax's quick build Phase 5e electric glider, so Bigfoot was packed away and the Chris Foss designed e-soarer took its place as the test ship for mastering the Core.

Like the Evo, the Phase 5e features a four-servo wing, with large flaps that can be used on their own or combined with the ailerons to provide crow braking. Both flap and crow braking would need mixing with some down elevator to prevent the glider rearing upwards when applied and being e-powered it would benefit from a motor off switch. And finally, the Phase 5e, like all my other electric models needed a countdown timer, activated by engaging the throttle. At about this point the similarities in the two gliders diverge somewhat as in reality they are about as similar as chalk and cheese, but the basic radio set-up I was about to embark upon would, I hoped, serve me well when flight prepping my large span moulded dream machine!

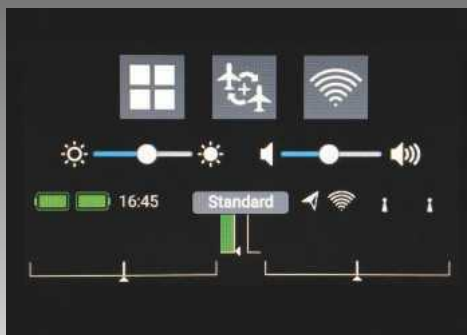
MAKE A START

Chances are that when you first start programming with the Core you will have it switched on for quite some time so do make sure that the two 3400 mAh Li-Ion battery packs are fully charged before you begin.

It also soon becomes apparent that this set is designed to be quick and easy to update, so it makes sense to download any available updates from the PowerBox



The home screen is blank at the beginning but can quickly be populated with 'widgets', such as the Down Timer shown here.



Swiping down brings up this sub menu. Press left to enter the Function Menu or press centre to look at the Model Menu.



We'll take a closer look at the Function Menu next time.

Terminal program, which itself can be downloaded from the company's website.

This magazine is edited using a MacBook, so I was a bit frustrated to not be able to find a Mac version of the Terminal, although there is a mobile version available on the App Store for iPhones and iPads (and for Android too). This requires the use of a wireless PowerBox BlueCom Adapter, which I do not have, so the easiest way out for me was to download the Terminal to my old steam powered laptop. Using the Windows version of the program, users can download updates to a USB stick, which is then plugged into the front panel of the Core radio to transfer them to the Tx. The USB stick can also be used to copy model set-ups from the Tx to your computer for back up; you could use the same stick for back up too but if you used it again for a future update all the data would be wiped, so beware.

Whilst the Terminal program is running it is worth checking out the Voicefiles and downloading the ones that best suit you to your USB stick. The Update and Voice files are kept separate because to cater for all the different languages requires several hundred MB of data, most of which would never be used. Each language needs to be downloaded separately to the Tx, however if you are multi-lingual then you can add additional languages by repeating the procedure.

If you don't download any voice files, then at some stage you will inevitably discover the Voice function. After typing in a phrase and pressing the play icon, you'll wonder why your shiny new radio doesn't speak back to you. No prizes for guessing how I found that out!

The 'English' voices are split roughly 50/50 between English and North American versions. You'll find that all the English voices are very well spoken, and there's even a mickey take of the Queen. I settled for the first chap on the list, although he's still a little bit 'plummy' for my taste.

MENU ACCESS

When first switched on the Core takes a little while to boot up the Linux computer. The home screen is initially quite blank, showing little more than the trim ranges for the four main sticks and the two battery indicators. However, the dark areas are intended to be populated by what PB call widgets and it is here that you will find, after you have set them up, the things that you will be most interested in whilst flying, such as timers and telemetry values etc. An example is the Down Timer that you can see in the nearby picture of the Phase 5e home screen.

The main menus are accessed by swiping vertically down, the touchscreen responding just like any modern smartphone or tablet. The icons are self-explanatory for the most part, although for the Phase 5e I did not use Flight Modes or Virtual Switches, so I hope to come back to them at a later date after programming the Infinity Pro.

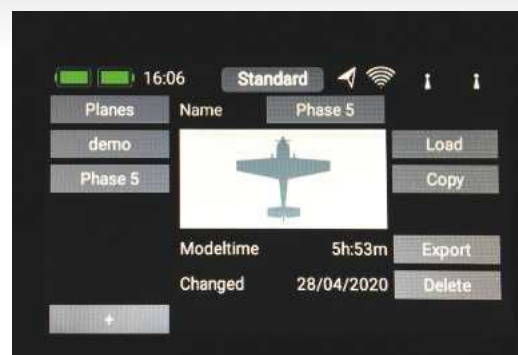
(Incidentally, what are often called Flight Modes, i.e. calling up different rates and exponential values via a two or three-position switch are easily set up as part of the Functions menu, as we'll see in a bit.)

When setting up a model you will invariably want to visit some of the main menu areas more than others, so there's a handy Areas menu which allows you to store and then open your favourite functions more quickly using the 'head and shoulders' icon at the bottom of the home screen.

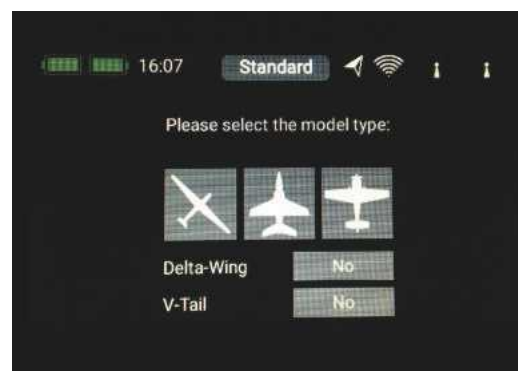
CREATE A MODEL

Pressing the Model icon in the main menu brings up a list of all the models stored in the Core, which can be loaded, copied or exported to USB by using the appropriate virtual buttons.

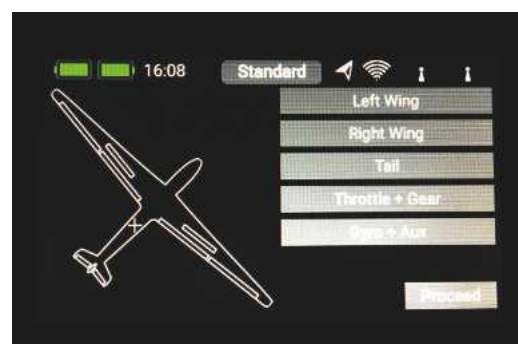
To make a new model you simply press the + icon and use the subsequent page to input the type of aircraft and its wing and



Model memories can be loaded, copied or exported to external memory via USB. Press the plus button to create a new one.



You'll be prompted to enter the aircraft type and Delta and V-Tail options.



The aircraft is then split into different sections. Press the virtual buttons in turn to set each one up.



Here's the port wing for a glider. Press Control to tell the computer which stick or switch to allocate to that control surface, then + to assign servos to it. Easy!



Pressing each Control button brings up this screen. Simply operate the stick or switch you want to use for that function, in this case a Mode 2 Aileron stick. Red arrows confirm the choice.

tail type. The next page allows you to set up each main part of the airframe (i.e. wing, tail, undercarriage) and any auxiliary items such as a gyro. For instance, calling up the wing will show all the popular wing layouts, so I selected the glider version to give separate ailerons and flaps. A graphic of such a wing appears, with the name of the matching functions underneath each control surface, i.e. Aileron L. Below each name is a transmitter Control button, which when pressed calls up an outline of the Tx showing all the sticks, switches and sliders. To select the appropriate control for any function all you have to do is to operate it on the Tx, so for Aileron L simply move the aileron stick and red arrows will appear above it on the graphic to show that it has been selected (this will also automatically assign the same stick to the right aileron). Now you can use the same process to highlight each flap and assign your preferred switch or slider to it before moving on to the tail and other functions.

WHAT, NO HELICOPTER?

If you're a bit puzzled why there is no helicopter option in the Model Type screen (a.k.a. the assistant) then this note from Richard Deutsch, Managing Director at PowerBox-Systems may help:

"We will have a Heli model in the assistant, but as you have seen the assistant only pre-assigns the functions. This will be the same for Heli, so it's not a big deal to manually make four Functions for a helicopter. It's two minutes work. You can also make any squash type mixing. I posted an example here: <http://forum.powerbox-systems.com/forum/index.php?thread/6277-how-to-120-helicopter-squash-type/> So, you can see, it only needs a few clicks to make a helicopter. It's part of the Core idea—open programming style."



When you have finished the Servo screen will show the list of functions and the sticks, switches and trims that you have assigned to them. Fine tuning can be performed using the Set Up buttons.

ALLOCATE SERVOS

After assigning the stick or switch for each function you then press the + button below to inform the Core which servo number you want to operate that particular control. Each servo can be connected to any channel, in any order, although it's only natural to revert to a favourite channel allocation that you may have from setting up older radios (JR's channel list in my case). To help avoid confusion when inputting servo numbers I found it helpful to write down a list of servo numbers and their matching functions:

Throttle	Servo 1
Aileron L	Servo 2
Aileron R	Servo 3
Elevator	Servo 4
Rudder	Servo 5
Flap L	Servo 6
Flap R	Servo 7

For larger or more sophisticated aircraft that use more than one servo to operate a single control surface you can allocate up to eight servos to a single function.

For the Phase 5e the ailerons and flaps are intended to be used as separate controls but if I wanted to I could also add Servo 6 to the Aileron L list and Servo 7 to the Aileron R list to give full span, four servo ailerons. The flaps would then move with the aileron stick, but would also operate as normal using the allocated flap switch

Such versatility means that mixed control functions like elevons will be a doddle to set up but obviously care needs to be used to check that the control directions are set correctly and, as with any mixing functions, to make sure that



A premium radio like this is best kept in its sturdy protective carry case.



Next time we'll dig deeper into the set-up of a Phase 5e electric glider.

servos are not overdriven when at the extremes of travel. If this is a concern, then the servo travel limits can be reduced using the Limit settings in the Servo menu.

After completing all the stick and switch assignments the first stage of creating a model is complete. Pressing Continue then brings up the Function Menu.

Next time we'll look deeper into those Function menu icons and start setting up the Phase 5e. ✈️



A FRESH APPROACH

Claimed to be the longest running R/C model show in the UK, the Wings & Wheels RC Model Spectacular has had to be postponed until 2021. But here's a flavour of last year's show

With 2021 heralding its 34th year, Wings & Wheels has been building on its established position in the show calendar by introducing some welcome changes to this great event. In 2019 the show started to see the rewards of this fresh approach with its new 'Fast & Furious' attractions such as UK DroneFest, Pyrotechnics and Night Flying.

Billed as 'The UK's Longest Running Radio Control Model Show', Wings and Wheels took place over the last weekend in June 2019 at its usual venue, the historic North Weald airfield near Epping, Essex. Formerly RAF North Weald, this is a famous Battle of Britain site and also the current home of the North Weald Airfield Museum, which features a collection of classic and WWII aeroplanes.

This is an all-round show featuring all forms of R/C models: planes, helis, drones, boats, trucks, tanks, even balloons - and a Dalek or two!

THE HEAT IS ON

The 2019 event had amazing weather; the hottest of the summer to date, and a perfect backdrop for all types of modelling. Traders arrived en masse on Friday. All was set for a weekend of modelling heaven and it did not disappoint. Visitors were treated to two days of all day flying by some of the best pilots, night flying, pyrotechnics, a bustling street of traders and live entertainment on Saturday Night.

The Bring and Buy, one of the largest of its kind, was packed, despite the early hour, and many satisfied bargain hunters were seen heading back to their cars to deposit newly acquired used airframes and engines before heading back into the showground to top up on some new gear. Walking past the seemingly endless procession of tents there was a good selection of new aircraft kits and products to entice the buyer.

SHOW TIME

The show kicked off promptly with Nick Johnson, now the regular commentator at North Weald. Taking to the skies were the many top pilots and superb models that make the show what it is - sadly too many to mention them all.

Sports Models and Civil Aviation Aircraft kicked the day off, along with Perry Lambert flying his 50% Clip Wing Cub.

Back for another year, the Panic Team brought their special type of demolition derby excitement to the air. They were followed by a superb display of WW1 aircraft and another solo flight by show regular, Steve Carr with his mega 4.6m wingspan Yak 54, which went 'smoke on' by firing up smoke canisters on its wingtips.

Helicopters, including agile Align T-Rex machines, joined in this year to support the rotor contingent at UKDroneFest, who, together with the aerial filming models produced some great videos that can be seen at wingsnwheels.net

TJD Warbirds and the Jet Display Team once again joined the flight line with their magnificent warbirds, contributing to the Pyrotechnics Battle Display - this was a real highlight!

Aerobatic displays featured heavily, along with the ever-present teams from MWM Warbirds and MacGregor Industries.

DRONEFEST

UK DroneFest was a great addition to the show, creating a dedicated outdoor display area for drones. There was even a surprise appearance by tiny drones during the band's evening entertainment and the new spectacular fireworks display, which took place during the day and on Saturday night.

Next year UK DroneFest is set to welcome the first Tiny Whoop British Open Championships. ✈️



THE NEXT SHOW

Is planned for 26th & 27th June 2021. Please keep an eye on the show's Facebook page or website for any changes to the dates due to Covid-19:

www.wingsnwheels.net

You can also visit the website to save up to 38% on Advance Day, Group Discounted and Weekend Camping tickets. The show team are all set for their 34th year and it looks like it could be even better when they eventually get the go ahead!

The most recent model to emerge from Chris Reid's neat workroom is this 60" span, electric, own design DH Dragon.



IN YOUR WORKSHOP

The Editor's request for pictures of your work rooms had you reaching for cameras and phones, and snapping busy building benches up and down the land. words & photos » RCM&E Readers

Winter is often described as the main building season but for many modellers their working areas are in fairly constant use. Spring and summer are especially valuable as once your winter project is out of the way and the building board is clear then now is a great time to give everything a good spring clean and to clear out all those never used bits and bobs that may be cluttering things up.

My motivation for asking for your workshop pictures was to help me with my own pending clear out and tidy up of my workroom, especially ideas about how to organise my tools to improve the chances of finding the right one without spending 10 minutes rummaging through a multitude of drawers and boxes! You certainly came up trumps, so here are just a few of the many responses that we have received so far...

Kevin Crozier

SPIRITFIRE HANGAR

Chris Reid is the first to invite us to look 'through the keyhole' into his modelling den:

"Your editorial mentions the state of workshops. Attached are three images of mine, which cover all the bases!

Bottom right of my workshop pic is a Guillows 28" span Spitfire. The very fiddly kit comes with

options to build it as a rubber model, free flight IC power or R/C model, and a control liner. Mine, yet to fly, has been modified for electric power and micro R/C."

I have to say that Chris' first picture made me chuckle as it looks just like my tool drawer and is exactly what I am trying to get away from! Mind you, the other pictures prove what an organised chap he really is. From the rack on the back wall, I guess he does rather a lot of filing?



Above left: I've got one of these! Like the Editor, it looks like Chris could do with a shadow board for his small hand tools. **Above right:** Small parts bins are neatly labelled. Try to avoid overfilling them though as it's very easy for individual bins to get stuck and then release suddenly, spilling everything onto the floor!





In all other respects Chris' workspace is well organised - and nicely lit too, which is also important.



Dave Hartley took inspiration for his neat workbench from an Ikea storage system. I bet he's not the only one to do that!

FEET FIRST

Dave Hartley's building room has an almost clinical look to it, thanks to a widely available Skandi drawer system. Plus, it helps that Dave is also pretty handy with his woodworking skills - that's a nicely built L-shaped bench!

"I copied this idea from a local chiropodist, who had used Ikea 'Helmer' drawers to keep her surgical equipment in. The units are simply bolted together and then raised above the floor on a plywood plinth. Obviously, the castors are discarded.

I can also recommend the 60 x 60cm EVA floor mats, which are available cheaply on eBay. As well as being soft to walk on they made a huge difference to my cold garage floor."

PRE-FABULOUS!

Upon buying a new house, a common theme with modellers is to requisition the garage as a modelling den. Geoff Willis from Devon had this very idea and his pictures show what can be done, even with an old prefab concrete affair. Nice job, Geoff!

"Unfortunately, the property we purchased has just a single prefabricated garage, so I have had to make the most of it. The workshop has the following features:

- Along one side of the garage I placed a mixed set of old MFI melamine bookcase units to house the tools and other equipment. However, I left a gap for storing the wings from my models in a vertical array, with an elasticated strap to keep them upright.
- I built an L-shaped work area from 18mm plywood and stud-work timber across the rear wall and down the adjacent wall to the window. Brackets and thinner ply provide underneath shelving for storing model fuselages. There is a space for my circular saw table. Old sheets were cut and pinned as front curtains to reduce the dust settling on the models.
- My old woodworking bench was positioned flush with the new worktop and a new small bench added for the milling/drilling machine. Shelving was fitted to the walls above the workbench and plastic storage boxes are used to hold all the bits and pieces, labelled with a computer operated Dymotape machine. Several multi-outlet mains extension connectors were fitted around the work area and four angle poise lamps ensure I can see to work, along with generous LED fluorescent main lights.
- A heavy, timber framed 18mm MDF building board is backed with felt so that it does not scratch the bench when moved and is surfaced with a sheet of Sundaela board. My Proxxon



Geoff Willis has done a nice job of converting a prefab garage. A space between the shelving units keeps his wings out of harm's way.



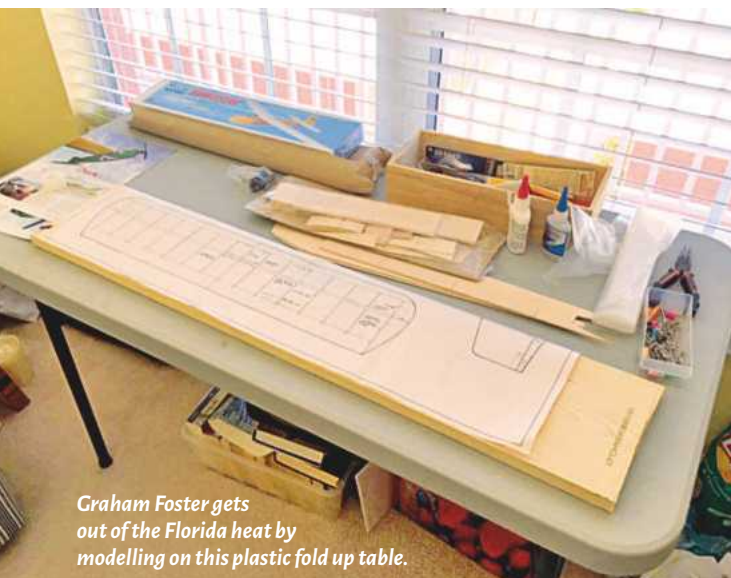
An L-shaped bench provides ample workspace, with plenty of power points above.



A separate, sturdy bench provides strong support for Geoff's machine tools.

mini drill hangs from a hook so that it is conveniently accessible when required.

- From Axminster Tools (just down the road from me) I have added a Series SX1 micro mill/drilling machine, an Axminster Craft AC125BDS mini belt and disc sander, and a Proxxon KS 230 miniature circular saw. Comfort equipment includes a Calor gas portable heater, a dehumidifier, a digital radio and a small wireless speaker.
- Keeping the workshop clean is important, so as well as a broom and a dustpan & brush, I have an old upright Dyson to clean the painted floor and a powerful Vax vacuum cleaner, which doubles up as a dust extractor when connected to the bench sanding machine and circular saw."



Graham Foster gets out of the Florida heat by modelling on this plastic fold up table.

A SMALLER WORKSPACE

Graham Foster, who hails from the extreme south of the USA, has the kind of problem that UK modellers can often only dream about!

"Just got the April RCM&E out here in Florida, with your comments about work places. We have had unusually hot weather here during March (over 90 degrees F) and my normal garage/workshop has become unbearable, so I have made a temporary work place in the spare bedroom. I am building a Sharkface from the free plan; I built one in 1965 with a Cox QZ 0.49. I hope this one flies as well with another Cox."

John's temporary workbench (using one of those fold up plastic tables, by the looks of it) is also a reminder that not all modellers have the luxury of a permanent workspace. Some people have to make do with the corner of a spare room, so a collapsible table and neatly boxed tools are a necessity instead of the rather more carefree way that some of us are lucky enough to build our models in. If that sounds like you, and you have some space saving workroom tips to pass on, then please email me to let me know: kevin.crozier@mytimemedia.com

WELL ORGANISED

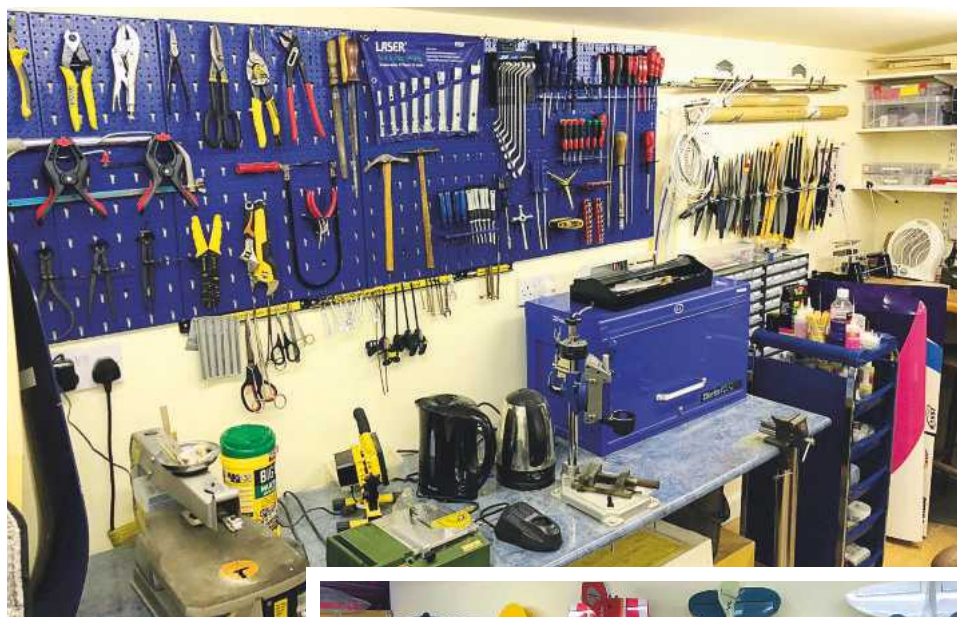
From Jon Laughton come these pictures of his extremely well organised workshop. It would seem that he can quickly lay his hands on any tool that he requires, with even his spare propellers being bolted together for easy access.

"Your request for contributions about shed organisation etc. really caught my eye as I think most of us find this really interesting - not only can we glean good ideas from others but also it 'scratches' the itch to see what other people do and where!"

Here are some pictures from my workshop; this is a garage that in size is between a single and a double and I have kitted it out specifically for my hobby with some old kitchen units. Storage of the numerous small parts we all need and other delicate items, together with tool storage, is always something that I am looking to improve on especially as my background is in running aircraft production facilities."



A variety of plastic boxes and bins provide a safe haven for Jon's accessories. Good labelling pays dividends when he is searching for a particular part.



Above: Now this is more like it! Jon Laughton can quickly find the correct tool for any job by virtue of his well laid out tool rack.

Right: Pairs of shelf brackets covered in pipe insulation foam offer safe storage for Jon's many fuselages.

Below: There's really no excuse for not finding the correct prop.





Mike White's motto is: 'A tidy workshop is the sign of wasted time!'



Mike's work area is actually quite well organised with things like his collection of clamps above the window falling easily to hand.

THE WORKTIP

Mike White's first picture reminds me of how my own model storage has looked in the past, although I must remember to show it to my wife to prove to her that compared to some, I don't have that many models - honest!

"In the February issue of RCM&E you mention blokes' workshops and the methods they use to keep everything tidy and easily get-at-able. So, I thought that it may bring a smile if I show you the other end of the story. This is my 'worktip' and as you see I do not do tidy. I would dearly love a neat workshop but mine was not designed as one from the start.

It started as a two-car garage when we moved here in 1991, when I retired and was used, at the

start, as a store for furniture until we had completed the redecorating. I worked around the house stuff and built a bench against the window - wrong! A building bench should be in the middle of the floor so one may work around the model from all sides. Anyway, by the time all was finished in the nest, I was so engrossed in a model that I continued with what I had. Model after model left me with no time, or inclination, to clean up my act and do things properly and cleanly. So now I tip toe around the stuff and do manage to get to my bench.

Some years ago, a great man once wrote in this very magazine, 'A tidy workshop is the sign of wasted time.' Who am I to argue with that?"



Eco warriors! Modellers should take a bow for repurposing all those old kitchen and shelving units that would otherwise end up on the local tip.



Look closely and you can just make out Peter Minard's sports car underneath his deceptively generous workbench.

"Some years ago, a great man once wrote in this very magazine, 'A tidy workshop is the sign of wasted time.'"

MINE'S AN MGB!

Back to the smaller workspaces, take a look at this image of Peter Minard's bijou building area, which he has cleverly constructed over the top of his classic sports car. Clumsily dropping a heavy tool over the side doesn't bear thinking about, although I'd wager that Peter normally protects his pride and joy with a heavy blanket or two!

BURIED TREASURE

Finally, from RCM&E's original electric flight columnist, Dave Chinery comes this suggestion for finding small tools on a busy workbench:

"Although our workbenches should resemble operating theatres, most, including mine, get cluttered and it can be hard to find tools when you want them. Tweezers are the least visible items on mine and I have adapted an idea from a book, 'Snow Tiger', about avalanches.

Before personal radio locators were common it was useful to attach a long red cord to one ankle so if the skier was buried in an avalanche the cord would likely stay on top of the moving snow, allowing quick location of the victim. I recycle the coloured pennants used for 27MHz, attaching one to each hard-to-find tool, making them much more locatable on a crowded bench. With enough pennants, you can even colour code them."

That's all for this month, but we do have some more readers' workshops to show to you in a future article. If you want to join in the fun and send us a pic or two and some words about your own man cave, then please do so. Just one request and that is to make sure that you send your pictures at a decent resolution - a megabyte or two will be just fine, but no kilobyte file sizes, thank you!

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ENGINES for sale. O.S. FS80, Laser 80, PAW .55 R/C, Mills .75. Please email dudleypattison@gmail.com for details etc. 07990 976393 (Wilts).

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BALSA USA 1/4-scale Citabria, well-built and unflown. With Laser 150 engine, not new but runs well and smoothly - £300. Collection required. Call Ken on 07768 991562 (Cambridge).

BALSA USA 1/4-scale Sopwith Camel, new in box. These are £375 new so grab a bargain - £300 plus postage. Call Ken on 07768 991562 (Cambridge).

SIX PFEFFER 0.6cc diesel engines. Mint condition - £110 each. Two Brown A23 CO2 motors, unused - £70 each. Graupner 212 helicopter, dismantled, fair condition, fuselage primed but unfinished - offers welcome. Call Gary on 07535 449700 (W.Yorks).

PRECISION AEROBATICS Edge 540. Has been stored for a few years. Wingspan 2m, with DA50 two-stroke engine, all HS servos, a Futaba R6008HS FASST receiver, carrying bags, spare props and full set of spare wings. Only flown a few times. Engine has probably not done enough hours to be run in. Excellent condition. Cost over £1600 to build - £850. Collection only. 07971 129267 (Notts).

FUTABA T6K, 2.4GHz 8-channel radio system. Transmitter combo set plus receiver. Unused, boxed plus manual - £120 postpaid with two free electric sailplane DVDs included. Call Mike on 01603 759256 (Norfolk).

CAMBRIA MIRI, 100" span slope and thermal soaring glider - £60. QV Yak-9, 1.52m span and 1.23m long. For .46 size engine or an 800-watt electric power system, unbuilt - £60. 07769 711830 (Berks).

EXTREME FLIGHT VANQUISH, F3A style aerobat. Flown once but too hot for me these days. Receiver ready and mint condition - £150. Call John on 01622 871942 (Kent).

HANGAR 9 VALIANT 10cc. A 69" span sport cabin high-wing ARTF model for electric or IC power. Unopened parcel from model shop. Reduced mobility forces sale - £210. Free Parcelforce delivery. Call John on 01434 322204 (Northumberland).

WANTED

EXHAUST MANIFOLD for an E.D. Bee and exhaust manifold for a Mills 1.3. Also Keil Kraft catalogues and single-channel gear. Good prices paid. Call Tony on 01782 317815 evenings (Staffs).

MILLS .75 parts, particularly cylinder assemblies. Clapped out is fine. Good price paid with grateful thanks. Email grayf37@sky.com or call 01908 617015 (Bucks).

ALL R/C ITEMS wanted. Planes, engines, radios. Complete collections bought. Email dorsetmodel@aol.com or call Michael on 01747 229725 (Dorset).

PROP DRIVER for an O.S. 50SX, or a damaged motor with that part. Please email jamesebastion@googlemail.com (Germany).

WEBBIT PLAN for the Steve Webb design. Will buy or copy and return. Call Allan on 07710 787010 (Glasgow).

ALL R/C MODELS, new or used. Planes, gliders, kits, engines, radio, cars, boats. Complete collections and/or job lots. Countrywide collection, no hassle cash buyer. email deserteagle357@hotmail.com or call David on 07940 791959 (N.Somerset).

A3D MODEL. Built or unbuilt. Something like a Balsacraft/Ripmax Extreme, Irvine Wildcard, Ripmax Bossanova, Weston UK Hype, or something similar. Call Byron on 07542 839896 (Warks).

E-FLITE PT-19 battery hatch. Mine has shattered on landing on a cold and frosty day. If you've got a partial airframe, then I'll happily buy the hatch and any other spare parts. Call Brian on 07426 888981 (Edinburgh).

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MISS SIZZLES

Next month's free pull-out Pro-Plan is for Miss Sizzles, a 45-inch wingspan sports aerobat designed by Peter Miller. Peter took the fuselage of his Size Zero design, enlarged it and changed the construction to sheet sides with a stringered turtle deck. Then he re-designed it for electric power. The wing is of 13% thickness, based on another of Peter's designs, The Ohmen, which is really nice for aerobatics.



NEXT BEST THING?

With real model flying being just a memory due to the lockdown, John Stennard looks at an alternative way of getting his flying fix - and finds that model flying simulation is the next best thing. John takes a look at the different types of flight simulators available before settling down for some Tx practice with his current sim of choice - Realflight Version 9.

NEXT ISSUE



CORE ESSENTIALS

The editor returns with a follow up to part one of his PowerBox Core radio review. This time he starts to get to grips with the comprehensive programming of this powerful Linux based R/C system by setting up a popular electric powered glider with flaps and crow braking.

RCM&E

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BATWING

The Vogel-Fly Batwing is different to most flying wings seen on the slopes as it features a built-up structure rather than the usual foam core covered in packing tape. Designer, Christian Vogel, wanted a 'Zagi' look-a-like with a difference. It certainly looks the part but under the skin there are some clever features. Mike Freeman takes a closer look.

RCM&E

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PARTING SHOT



A MISTY DAY AT WHITE SHEET

Missing your flying fix? Unless you are one of the lucky ones with a suitable patch on your doorstep, hopefully our absence from the slopes and flying fields will be over soon. In the meantime, maybe you can use this evocative shot from our regular vintage scale glider correspondent, Chris Williams, to whet your appetite for those much longed for flying sessions to come? Fingers crossed though that will be before high summer, not the autumn, when this picture was taken...

Photo: Chris Williams

Camera: Canon EOS 70D

Aperture: f/5.6

Focal length: 90mm

Shutter speed: 1/1328 sec

Lens: EF 70-300mm f/4.5-5.6 L USM

ISO: 100



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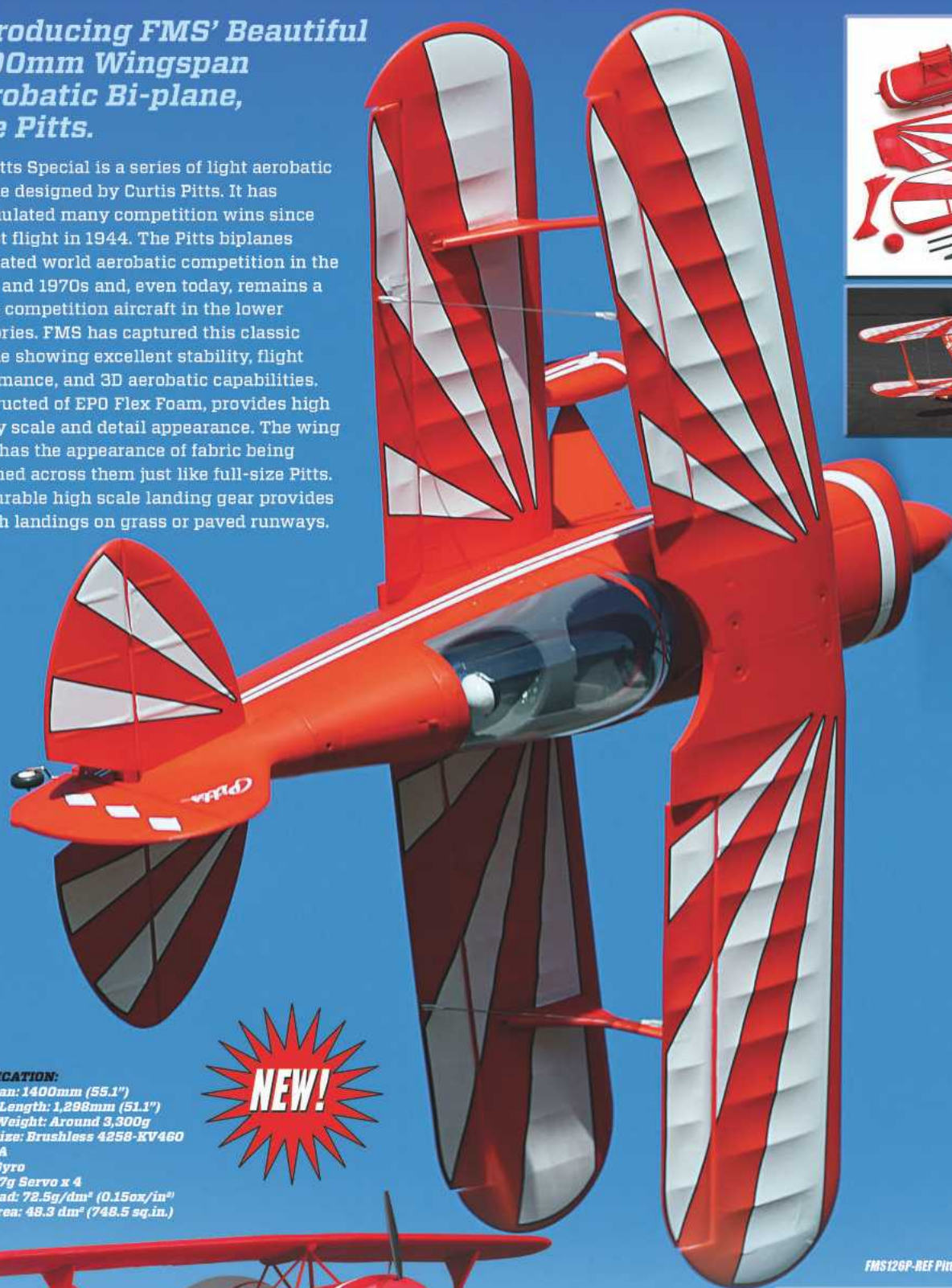
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