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RC **MODEL WORLD**

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MAY 2017



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400

400th ISSUE

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To celebrate our 400th issue we have reprinted our first ever plan feature, which was for Dave Womersley's quarter scale Gardan Minicab, which he designed after taking a trip in a full size example of this pretty aircraft. Dave's article, which dates from 1984, starts on page 16 of this celebratory edition of RC Model World

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To toast the publication of our 400th issue we have reprinted a revised version of RC Model World's very first Plan Feature. Designed by Dave Womersley, this highly detailed 1:4 scale model of the Minicab has a 75 inch wingspan and suits a .60-.90 size two-stroke glow engine

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Pre-flight

Welcome to the May issue of RC Model World. With the growing amount of largely free content available online these days, ranging from the good, the bad, to the downright ugly, it's good to see that there's still some demand for magazines across most hobby disciplines, including the various forms of model flying.

Whilst there's no denying that more and more people are reading using their phones, tablets and computers (including our own growing digital readership), thankfully there are still enough folk who enjoy taking a monthly printed magazine, including those that buy RC Model World on a regular basis. So as the current editor of this much-loved title, it gives me great pleasure in being able to present to you this, the 400th issue of RC Model World.

Our anniversary edition kicks off with a reprint of our very first plan feature, which was for Dave Womersley's 1/4 scale Gardan Minicab, an attractive low wing monoplane.

To brighten it up a bit we've even managed to include a few colour pictures this time around!

If this particular model doesn't encourage you back to the building board then maybe one of the four excellent plans that we have selected for this month's 'Pick Your Own Plan' offer might be more to your liking? Please turn to the centre spread for more details.

On review we have the SuperEz trainer/sportster from CML, as well as Hacker's latest EPP profile 3D aerobat, the Edge V3 Toxic. We also test the comprehensive DC-24 radio system from Jeti.

To celebrate our 400th edition please join me as I look back at the very first issue of RC Model World and every 100th milestone issue in-between. Plus, we continue our short series on modelling glues; this time we take a look at PVA and epoxy adhesives to show how they work and how they can be formulated for specialist applications.

Add on our usual selection of regular columns – this time scale gliders, petrol engines, EDF jets and sport models are in the spotlight – and we hope that this month's special issue is one that you will want to keep for many years to come. Well, at least until issue 500 comes along!

Until next time...

Happy flying!

Kevin

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Editor | Radio Control Model World

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GT X4 DJI P3P4

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Take Off R/C News and Views

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

E-Vulcan



E-Vulcan was recently published as a free pull-out plan in the January 2017 issue of RC Model World. This simple to build, 42" span Depron delta, designed by Graham Dorschell, quickly builds into a three function R/C sport-scale jet model for a pusher prop and a 3S LiPo.

It's always most pleasing to see models built from Traplet plans by our readers and Roger Vaughn was especially quick off the mark with his own take on the Avro bomber. Roger writes:

"The E-Vulcan has flown beautifully with the following mods... Folding prop and 3/16" reflex section on both wings. (I had to fly the first flight with full up all the time!)"

Great job, Roger and thanks for sharing her with us.



Opale Fest

Do you fly radio controlled paragliders and paramotors? The Opale Fest, created in 2014, is a chance to get together with like minded R/C Paramotor enthusiasts.

The 2017 event is scheduled for 3-4 June and will take place in the mountain landscape of Isère, located at one hour from Lyon and 30 minutes from Grenoble. The organisers, Opale Paramodels say, *"This perfect spot allows anyone to fly and discover this activity in a warm and friendly atmosphere. So please join us!"*

Keep up with the latest information on the event forum: <http://parapenterc.com>

Or visit the Opale Paramodels website:

www.opale-paramodels.com/gb/smartblog/23_opale-fest-v3-pret-pour-le-rock-n-fly.html

PowerSafe Telemetry Receivers Recalled

Horizon Hobby LLC has been made aware of some issues with the AR9130T, AR12300T, and AR20300T PowerSafe Receivers. In certain circumstances these issues create a safety hazard and may result in a crash. Owners of these receivers are advised to discontinue use of these products immediately and to return them to the place of purchase for a full refund.

Back To Barkston

The BMFA have confirmed that the Power National Championships will be returning to RAF Barkston Heath in 2017. As previously the 'Nats' will take place over the August Bank Holiday weekend of 26-28 August.

The construction work which caused the airfield to be made unavailable to the nation's aeromodellers last August has now been finished and the RAF have re-affirmed their commitment to support the BMFA's two Nationals at the airfield (the other being the Free Flight & Space British National Championships from 27-29 May) wherever possible, subject to operational requirements.

On their website the BMFA say, *"We would like to express our gratitude to the Commandant of RAFC Cranwell and his team for their assistance and co-operation in facilitating our continued use of RAF Barkston Heath for 2017. Further details will be made available in the BMFA NEWS and on the BMFA website in due course."*

More details about the BMFA Power Nationals and other BMFA National model flying events can be found on the following websites:

www.bmfa.org
bmfa-nats.org

Diary Dates Prove Their Worth

Michael Carter from the Bedworth and Burbage Aeromodellers has written to tell us of the positive response to the club's Swap Meet on the 5th March following exposure in a recent Diary Dates feature:

"Thank you for advertising the Bedworth and Burbage Aeromodellers Swap Meet in 'Diary Dates'. Although our takings were a little down on last year the Swap Meet was a great success, with the tables being completely sold out."

Advertising in RC Model World's 'Diary Dates' plays an important part in bringing our event to the attention of aeromodellers in general."

Glad to be of assistance, Michael. Proof, then, that exposure in a print magazine like RC Model World still works, so if you are organising an R/C aeromodelling event of any description then please send us the details so that we can help spread the word.

StickMover

A recent start-up company from Germany called AVIrem has just reached its 125,000 Euro target on the Kickstarter crowd-funding website to allow them to put into production a novel R/C simulator product called StickMover.

With StickMover's R/C style transmitter you can learn to master complex aerobatic and 3D manoeuvres by watching a model fly on your computer screen, whilst feeling the matching stick inputs.

StickMover looks just like a regular R/C transmitter but instead of controlling a model aircraft it leads you through selected manoeuvres step by step. As you watch the model's flight on your screen the StickMover goes through all the motions, letting your fingers feel exactly what to do at any given moment. By watching, feeling and repeating what happens on the sticks you learn the right moves intuitively.

You can see the StickMover in action here:

www.youtube.com/watch?v=yJEBOV8fqRo

Alternatively, for more information please visit the AVIrem website: www.avirem.de/en/



Traplet Bang Seats



This 3D printed scale model kit of the Martin-Baker Mk3H Ejection Seat was created after careful study of an operational full-size seat to ensure that the model really captures the scale and proportions of these vital safety devices.

The Mk3H ejection seat was fitted to single-seat Hawker Hunter aircraft, a type that served many air forces all over the world and which is still used operationally over 60 years after it first flew.

The scales of these models have been chosen to match Traplet's two popular Hawker Hunter R/C model plans/wood-packs, MW3603 and MW3241. The model is easily assembled using the adhesive of your choice and can be painted with normal modelling acrylics or enamels. Its modular design means that if you intend to install it in an R/C model you can omit parts to save weight if necessary.

The harnesses are supplied flat and can be warped into the shape you want with the careful application of heat. Additional details such as cables and wiring can be added using scrap electrical wire in various sizes, and a piece of short-pile fleece fabric can be used to represent the sheepskin cushion cover often used by pilots.

Suitable for installing in an R/C scale model or simply just for display, these 'bang seats' are sure to appeal to anyone with an interest in aviation.

Please note these models are produced to order, so please allow 14 days for delivery.

Each kit contains:

Main Beam
Seat Pan, Parachute Container & Head Box
Head Rest, Face Blind & Seat Pan Firing Handles
Parachute Pack, Personal Survival Pack & Seat Cushion
Seat Harness (5-part) & Parachute Harness (6-part)
Adhesive Labels & Display Stand

Product Code: **3D3603**

Name: Mk3H Ejection Seat (1:6 Scale)
Height: 19.9 cm
Weight: 270 g
Price: £85.95

Product Code: **3D3241**

Name: Mk3H Ejection Seat (1:11.5 Scale)
Height: 10.3 cm
Weight: 72 g
Price: £35.95

Please order from:

Traplet Publications Ltd (Plans Service)
Traplet House, Willow End Park, Blackmore Park Road, Welland, Malvern WR13 6NN
Telephone Hotline: +44 (0) 1684 588599
Email: customerservice@traplet.com
Website: www.trapletshop.com

Super Constellation

Jean-claude Gerard in France is another reader who has shared details of a recent Traplet plan build. Jean-claude writes:

"I send to you the photos of my Constellation, built with your short kit.

It is perfect and your kit is wonderful, so thank you very much. It is flying very well."

Thank you for sending pictures of your fabulous 'Connie', Jean-claude. You have made a superb job of building her.

If other readers fancy following Jean-claude's example and want to build a Super Constellation then several options are available from the Traplet Plans Service:



Lockheed Super Constellation – Set

If you're looking for a really big project then this nine sheet plan for an impressive 88 inch (2.23 m) wingspan Lockheed L-1049 Super Constellation could be for you. Designed by Phil Noel, the model is powered by four electric motors and the plan includes details for installing a retractable undercarriage. The model is built in sections for easier transport.

A set consisting of the plans, ABS cowls and a laser cut wood pack is available. However, you will need to buy additional sheet and strip wood to complete the model, as well as all the hardware needed.

Please use the following order codes:

Plan, ABS cowl and laser cut wood pack set
SET 3663 - £216.99

Plan only
MW3663 - £31.50

Lockheed Constellation – Plan

Designed by Paul Janssens, our smaller 68 inch wingspan Connie handles extremely well. Originally designed for four Speed 400 electric motors, it would make an excellent conversion using suitable brushless motors.

Plan only
MW2498 - £13.50

Please order from:

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Shop Window

New kits and accessories

ROCHOBBY FALCON 1220 MM



Now available from CML Distribution, this Falcon has a super cool appearance, sporting a vibrant red and blue paint scheme with a simulated falcon head on the side that will surely draw attention at the flying field. Additional features include functional CNC machined oleo style retracts, a large cockpit with pilot and other scale details. The Falcon is assembled with screws only (no glue!) so you can be out and flying in no time! If these features are not attractive enough, you can add the optional float set; the enhanced power system allows the plane to take-off and land on water with ease.

www.cmldistribution.co.uk

HITEC FLASH 8



Model pilots who are on the look-out for a reasonably priced, eight-channel radio control system should check out this radio, which is perfect for all kinds of model aircraft. Flash 8 uses AFHSS technology, which offers extremely low latency, accurate 4096 step resolution, plus compatibility with the SLT protocol and excellent range. It enables you to store data for up to thirty models, while the full telemetry capability and comprehensive programming facilities allow you to optimise your model's performance very easily.

Also, for the slimmer wallet, Hitec also offer the Flash transmitter in a seven-channel version.

jperkins.com/radio-accessories/radio-systems-combos

BELLANCA SUPER DECATHLON 60 ELECTRO ARF



This famous aerobatic aircraft is now available in a new semi-scale electric version from Hacker Model Production. Easy to fly, this 2000 mm wingspan model has larger ailerons than Hacker's original IC model and it is also suitable for towing gliders. The NACA 2412 aerofoil and lightweight construction from high-quality balsa and plywood gives the Super Decathlon excellent flight characteristics. The Bellanca is covered with iron-on film and is available in three colour designs. All spare parts are available. To complete it you will need a minimum four channel R/C set, four standard servos, an M FORCE 5050EA-8 or M FORCE 5060EA-8 brushless motor, an MC-80A ESC and a 5S or 6S 3300-4250 mAh LiPo.

www.zoomport.eu/shop/

DYNAM PRIMO BUSH CUB 1450 MM



Modelled loosely on those famous high wing workhorses that roam the skies over some of the world's most out of reach locations, the Primo is pretty much the ideal choice for those modellers with none too perfect runways and flying fields. The 1.4 m wingspan and working flaps help minimise the take-off roll and landings if space is a concern and the Primo is a great model to learn your STOL techniques with. Powered by a BM3720A3-KV650 brushless motor and a Skylord 40 amp ESC, the Primo offers a wide flight envelope and ample power for pulling herself out of trouble when you need it, yet offers outstanding slow flight capabilities for those newer to the hobby.

www.cmldistribution.co.uk

PICHLER TWIN OTTER



The newest addition to the Pichler Modellbau model range is the Twin Otter. This is an ARF aeroplane model with an 1875 mm wingspan and it comes factory set up and expertly covered. The original plane is a STOL (short take-off & landing) aircraft with 19 seats and only needs short runways for take-off and landing. The model comes with a tricycle landing gear as

standard and the optional float set makes the Twin Otter a great water plane. Two different colour schemes are available: Yellow (Canada Design) or White/Red (Swiss Design).

www.pichler-modellbau.de

DELUXE MATERIALS FIX 'N' FLEX



This new glue from Deluxe Materials is a clear, tough, resilient, gap-filling adhesive that bonds foam, plastic and metal. It has exceptional surface grip and is safe to use, curing at 1-2 mm/hour, ensuring joints that are both waterproof and heatproof. It is especially effective where joints need to flex, expand, gap fill or withstand shock or vibration. It's ideal for constructing and repairing foam models, bonding plastic servo trays and motor mounts into foam and for bonding plastic or carbon fibre stiffeners into foam. It's also non-corrosive and non-aggressive to paints, plastics or electrical parts. It should be applied with a spatula or wet finger and a smear of liquid soap will ease surface contouring and smoothing. Fix 'n' Flex is supplied with a small purpose made dispensing nozzle and excess adhesive can be cleaned with white spirit.

www.deluxematerials.com



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The model is easily assembled using an adhesive of your choice, and can be painted with normal modelling acrylics or enamels. It's modular design means that if you intend to install it into an RC model, you can omit parts to save weight if necessary. The harnesses are supplied flat, and can be warped into the shape you want with the careful application of heat.

Additional details such as cables and wiring can be added using scrap electrical wire in various sizes, and a piece of short-pile fleece fabric can be used to represent the sheepskin cushion cover often used by pilots.

Suitable for installing in RC scale model aircraft or just for display, they are sure to appeal to anyone with an interest in aviation.

For more information and to purchase this kit, please call +44(0)1684 588599 or visit www.trapletshop.com (search: Mk3H)



1:11.5 Scale Kit also available for only £35.95 + P&P

Get The Plan!

This kit is designed to match the 1:6 scale Hawker Hunter RC model plan designed by Shane Harding. A laser-cut woodpack and plastic moulded canopy are also available.

Plan Specifications

Wingspan: 68" £27.50 + P&P
Radio Functions: 7 Product Code: MW3603

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Gardan Minicab GY20

To toast the publication of our 400th issue we are pleased to reprint a revised version of RC Model World's very first Plan Feature! Designed by Dave Womersley, this highly detailed 1:4 scale model of the Minicab has a 75 inch wingspan and is drawn on three large sheets. For four function radio, plus flaps, the plan shows details for a .60-.90 size two-stroke glow engine, but the chunky fuselage is ripe for an electric conversion (not detailed)

MODEL WORLD

AT A GLANCE

WINGSPAN:	75" (1676 mm)
LENGTH:	51 1/2" (1.31 m)
WEIGHT:	8.5-10 lb (3.85-4.54 kg)
RADIO FUNCTIONS:	Throttle, Ailerons, Elevator, Rudder, Flaps
BASIC CONSTRUCTION	
MATERIALS:	Balsa, Ply, Spruce, Hardwood (Engine Bearers)
COVERING MATERIAL:	Solartex
CENTRE OF GRAVITY:	4 3/4" (121 mm) from Leading Edge
CONTROL THROWS:	Ailerons: +/- 5/8" (13 mm) Elevator: +/- 1" (25 mm) Rudder: +/- 1 3/4" (44.45 mm)
ENGINE RANGE:	.60-.90 cu in four-stroke, .90-1.20 cu in four-stroke
ENGINE USED:	Magnum .91 FS



The Minicab has beautiful lines and has proved to be an excellent subject for scale

My interest in the Minicab goes back to 1975 when I had a one hour flight in prototype G-AWEP from BAE Sablesbury airfield with builder Stan Jackson. This aeroplane was built in Stan's garage and transferred to the then B.A.C. aerodrome for final assembly prior to being test flown by Roland Beaumont, who was B.A.C.'s Director of Flight Operations at the time. Following my flight with Stan, I took a roll of black and white film from all angles of the aeroplane, thinking that this prototype would make a good scale model in the future. Fired with enthusiasm, I contacted J. VV. G. Ord-Hume, the aircraft designer and he

sent me a few general arrangement plans from which I produced 1/5th scale drawings, giving a span of 60 in for my ageing H.B. 61. However, the project was shelved while I built a Dennis Bryant Tiger Moth and 18 months passed by. In 1981, the British Aerospace M.A.C. at Warton held a social evening in the form of an auction with guest speaker, Stan Jackson talking about building and flying his Minicab. The talk was illustrated with slides and a film of the test flights and afterwards I arranged to meet Stan at his home to discuss the aircraft in more detail. The result was that I came away with a full set of plans and a couple

of colour slides to help with the final colour scheme.

The Model

I started drawing the plans late in 1981 and as I had recently acquired an O.S. 61 FSR, I decided to increase the scale to 1:4, giving a wingspan of 75". Several evenings were spent thumbing through thirty-odd sheets of plans and it soon became obvious that a very accurate model plan could be produced, with construction almost identical to the full size. However, with the relatively short nose the model would have to be as light as possible to maintain a 30% C of G.

It will be seen that the basic structure is quite straightforward and it should not offer too many problems to a modeller with average experience. One or two points require a little more attention, such as forming the cockpit canopy and frame, the undercarriage oleos and mounting brackets and the litho plate engine cowlings; these can be treated in alternative ways with similar satisfactory results, e.g. the canopy need not be hinged and opening and would be much simpler to make and less time consuming if fixed.

The undercarriage could be the standard torsion bar type with slight modifications to the wing structure and the engine cowling

could be of built-up balsa ply construction. A conscious effort was made to keep the weight down as I am a great believer in the old saying 'the heavier they are, the harder they fall' and a lighter wing loading always makes for a more pleasurable flying model.

As the model progressed, I monitored the weight at various stages of construction and it appeared that the overall weight was going to be in the region of 8½-9 lb, giving a very respectable wing loading. However, as I started adding scale detail the weight crept up and a check of the C of G indicated that approximately 12 ounces of nose ballast was required. I dislike carrying ballast and - as I had recently acquired a Magnum 91 four

stroke weighing around 30 ounces, in it went, bringing the C of G to 30% but taking the total weight up to 10 lb.

I feel that if the model was built with sport scale in mind the steerable tail wheel assembly could be replaced with a lighter one, the servos and receiver could be sited further forward in the cockpit area, the undercarriage could be simplified and therefore lightened etc., thus shifting the C of G and permitting a lighter engine and an all up weight nearer 8½-9 lb.

Fuselage

As stated previously construction is not too difficult and in most areas it is quite traditional, with square section spruce longerons, ply doublers and balsa spacers, all held together with simple balsa or ply formers. The front bulkhead is a stout 1/4" ply former with hardwood engine bearers supported in formers C1-C3 and C4, which also locates the wing dowels. The front cowling is laminated from balsa, which is built up onto N1 and keyed onto the front of the engine bearers. The engine bearers divide the cowling area equally to give ample space for any engine combination, with the port side used for the fuel tank.

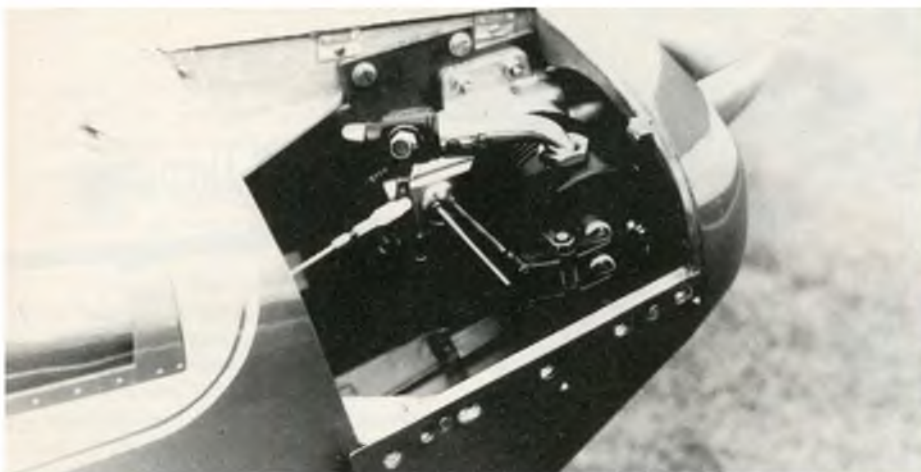
The original plan was to use a 14 oz tank for the 61 but as the Magnum was more economical a 10 oz tank was installed. For fitting engines requiring a silencer there is ample space to fit a remote box under the engine and against the bulkhead, but I have found with the Magnum that a remote silencer was almost ineffective except at low rpm when the idle was very quiet, so I have simply extended the standard exhaust pipe to exit through the cowling in the scale position. The turtle deck aft of the cockpit is built up using formers and 1/4" x 1/8" balsa stringers, but rather than cut the formers from sheet balsa, which would have been expensive and heavy, I laminated them using strips of 1/16" x 1/4" balsa around a row of pins closely spaced around the former profile over the plan, in a similar method to that used for wing tip profiles etc.

The engine cowlings on my prototype are formed from .012" litho plate and hinged at the centre-line giving good access to the engine and fuel system. The lower engine cowling is not hinged but is removable after releasing four screws, although this is rarely necessary.

As mentioned previously a built-up cowling could be produced using the front and rear cowling formers as supports for a 1/32" ply cover, with suitable bracing of the two formers. I would suggest that the lower cowling could be permanently fixed, with the upper removable in either one or two pieces, split on the nose centre-line. With a fixed lower cowling the installation of a Magnum, complete with exhaust pipe, is tricky but possible.

The fin is conventional and integral with the fuselage structure. The 1/16" sheet balsa immediately above the tailplane centre-line must not be added until after the tailplane has been finally fixed.

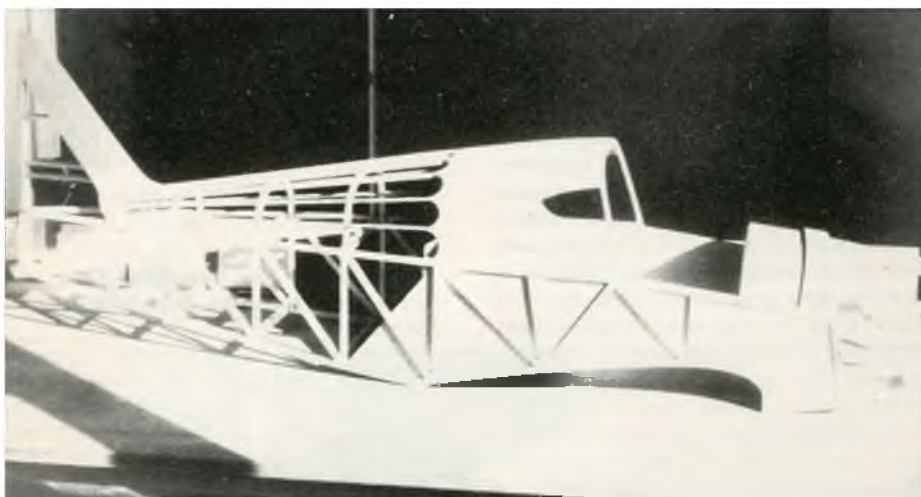
The cockpit canopy was a daunting task as I intended to make it hinged, as per the prototype, and with a flimsy supporting structure I thought that it would be a rather weak assembly. However, this is not the case, as once the acetate sheet is fixed into position, the assembly becomes quite strong.



A Magnum 91 fits nicely and is easily accessible through the large access hatch



Centre hinged 'bonnet' provides easy access to the fuel tank. Apologies for the high contrast of the black and white pictures, which have been scanned from the original magazine article



Fuselage construction nearing completion

The canopy frames are laminated from 1/16" balsa and 1/32" cross grain ply of the correct widths, in a similar fashion to the turtle deck formers. The top lamination is of balsa in order to sand it to the correct shape for the acetate sheet to be fixed to. The frames were then assembled into position on the fuselage and the spruce braces added. The acetate sheet is a flat wrap around the framework and I found, by laying the sheet over the framework and applying heat carefully with a heat gun, the curved shape could be pre-formed before sticking it down using Evostik. The 1/4" ply wing mounting plates are fixed

into the corners of the wing bay and braced back to the fuselage doublers with 1/8" ply gussets. With the wing set in position on the fuselage and the wing mounting dowels located, the mounting plates are marked through the wing fixing holes. The wing is then removed and the holes drilled and tapped into the plywood plates. I have been using this method for many years and have never had a thread fail in plywood. For a little additional security balsa cement can be run into the threads and the nylon bolts screwed in, forcing the cement into the threads. When dry, the balsa cement forms a

hard skin on the threads and the bolt can be easily removed.

Wings

Unlike the fuselage structure, which assembles fairly quickly, the wings are more time consuming due to the Frise ailerons and inset flaps. The basic construction is quite conventional, with two forward spruce spars, two balsa rear spars, a balsa leading edge with top and bottom sheeting and plywood braces front and rear.

The wing panels are assembled onto the centre section over a jig in order to achieve the correct dihedral angle and incidence before the leading edge sheeting is added. The slots in the plywood wing braces are then adjusted to allow the braces to be dropped in from the underside, once the framework has been lifted from the jig. I prefer to laminate my own wing braces using 1/16" plywood and Resin 'W' white glue. No problems should be experienced with the flaps as long as the hinges are free and the control rods and bell-cranks operate correctly before the sheeting is added.

The aileron hinges are home-made from 1/16" Tufnol board, brass tube and 10 BA screws, nuts and washers. The Tufnol leaves of the hinges must be accurately made and fitted using templates to ensure that the hinge pins are in the correct position. The same applies to the fixed part of the hinge in the ailerons, otherwise the Frise action will not function correctly and the ailerons may bind against the trailing edge of the wing. This method may sound unnecessarily complicated but in practice it works very well and ensures an accurate aileron location.

Due to the Frise ailerons the outboard trailing edges are of unusual construction, with hard 1/16" balsa sheeting on the top surface and 1/64" Miralyte plywood to form the double curvature on the under surface. A template is made from thin card to represent the 1/64" ply and this is held in place over the double curve underside of the ribs using female formers from scrap 1/8" plywood at each rib position. The card is clamped using bulldog clips between the ribs at the rear spar positions and at the trailing edge the card is clamped to the 1/16" balsa in a similar manner.

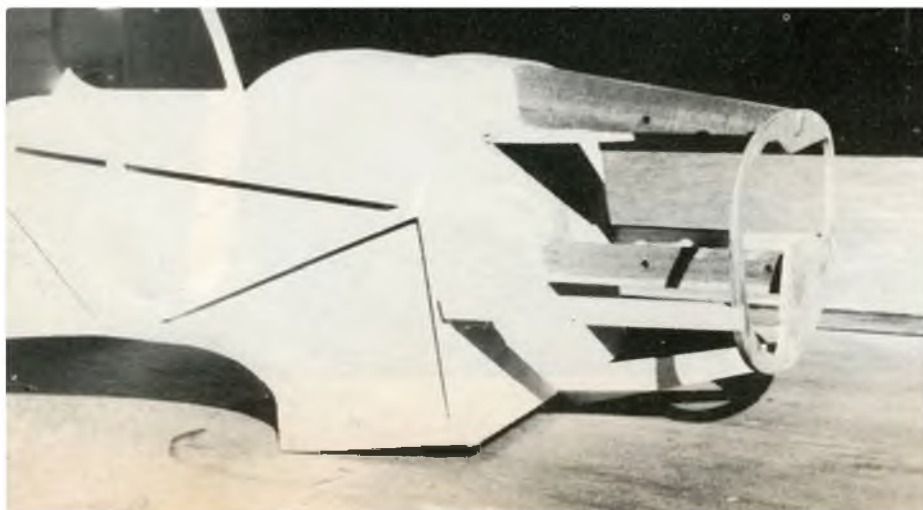
When this assembly has been completed and the card trimmed to fit perfectly, the template is used to cut the 1/64" ply pieces and the whole assembly is rebuilt using white glue. The built up ailerons are simple to build, although care must be taken when shaping the soft balsa leading edge to achieve the correct shape for matching the wing trailing edge at all aileron angles.

The closed loop aileron control system is similar in operation to the full size using 60 lb breaking strain plastic covered fishing trace in aluminium tube guides around the bends, terminating in clevises in the servo bay at the wing centre section.

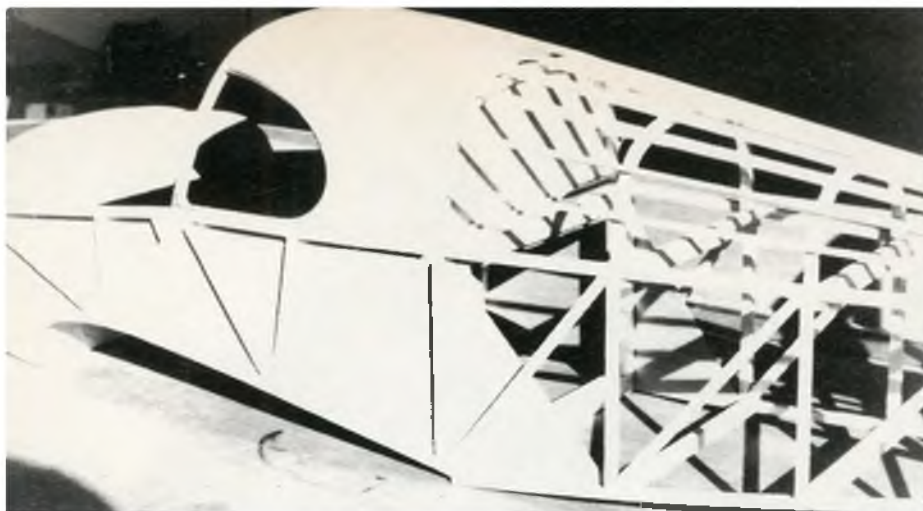
The clevises are attached to the cables using small bore threaded adaptors (Kavan) super-glued and crimped in position. At the aileron end the cable is passed through the control horn, doubled back, with an aluminium tube ferrule super-glued over the cable end.

Undercarriage

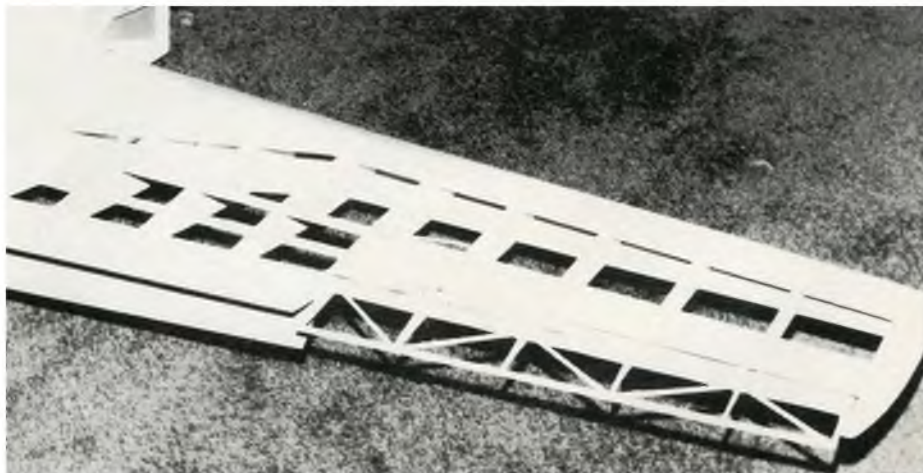
The torsion bar undercarriage shown on the plan does not require any explanation. The oleo system is made from readily



Front end, with engine bearers in place



Construction detail rear of the cockpit



Wing showing flap and aileron detail

available materials and requires a small amount of machining work. The principle is quite simple, with a 6 SWG U/C leg passing through a guide at the bottom of a 3/8" dia. stainless steel tube and then through a second floating guide towards the top of the tube. The top guide is retained with a split pin above it and the leg is prevented from rotating by a piano wire peg that passes through a drilling in the U/C leg and rises in slots in the 3/8" tube as the suspension works.

The suspension is created by a spring of the desired strength, which is compressed

between the top guide and the piano wire guide peg. The complete U/C legs are silver soldered to mild steel brackets (20 SWG), which are attached to the main spar bracing using 10 mm Rawlnuts. Rather than mount the U/C brackets directly to the wing bracing, some 1/4" thick soft rubber was introduced between the bracket and bracing in order to give a little forward and aft shock resistance.

The complete assembly can be dismantled by removing the split pin, which helps when selecting the correct spring rate, and the pre-load on the spring can also be adjusted by introducing packing (soft rubber) washers

between the top of the upper guide and the split pin.

The machining operations beyond the scope of the average modeller's workshop are turning the Tufnol guides, machining the slots in the tubes and drilling the 6 SWG U/C leg for the peg, although they are simple jobs for a small machine shop or a model engineer.

Tailplane And Elevators

The tailplane is built in two halves, top and bottom, and is only joined after the 1/16" balsa sheeting has been added. This is a simple and accurate method as the half ribs, split on the horizontal centreline, can be assembled flat on the building board with no need for jiggling up the symmetrical section.

The tips are laminated from 1/16" balsa and provided that the balsa is soaked in water for a few minutes before assembly the tight curves are no problem. My method is to laminate the tips over the plan before starting the main tailplane elevator structure so that they can be trimmed to fit the main structure as required. All the laminations are glued using an aliphatic or white glue and placed together in one operation and fixed around a row of closely spaced pins on the plan.

With the wet sandwich of balsa and glue, the laminations slide very easily to take the desired shape. When the top and bottom of the tailplane are complete they are glued and clamped together and given a final sanding.

The leading edge of the centre section has to be cut out and reinforced to fit the rear of the main fin spar. Both the elevators and the rudder are hinged using single point hinges, epoxied into sockets formed in the trailing edge of the tailplane and the leading edge of the elevator, and are not added until after the model has been covered and painted, but immediately before fuel proofing.

The combined elevator joiner and horn (I used a SLEC one) must be installed before the 1/16" balsa side sheeting is added to the fin, immediately over the tailplane centre section and preferably connected to its Bowden cable before the tailplane is slid into position.

Covering And Painting

I had intended to cover the fuselage top and sides in one piece of Solartex but unfortunately the roll is not quite wide enough and a join was made along the top fuselage stringer. The tailplane was covered before being fixed to the fuselage, with the area of contact with the fuselage left uncovered. The complete airframe was sprayed using vehicle cellulose and sufficient coats were added until the surface texture was correct. A few ounces could have been saved with fewer coats of paint, and a skilled operator would probably achieve an acceptable finish with fewer coats.

After the trim and registration letters had been brushed on using vehicle coach enamel the whole airframe was given a couple of thinned coats of Tufcote. The control surfaces were then hinged in position and the whole airframe was given a further two thinned coats.

Scale Detail

Scale detail is a matter of personal choice and the use to which the model will be put will dictate the amount of detail required. The registration letters were hand painted using vehicle enamel with a card stencil of



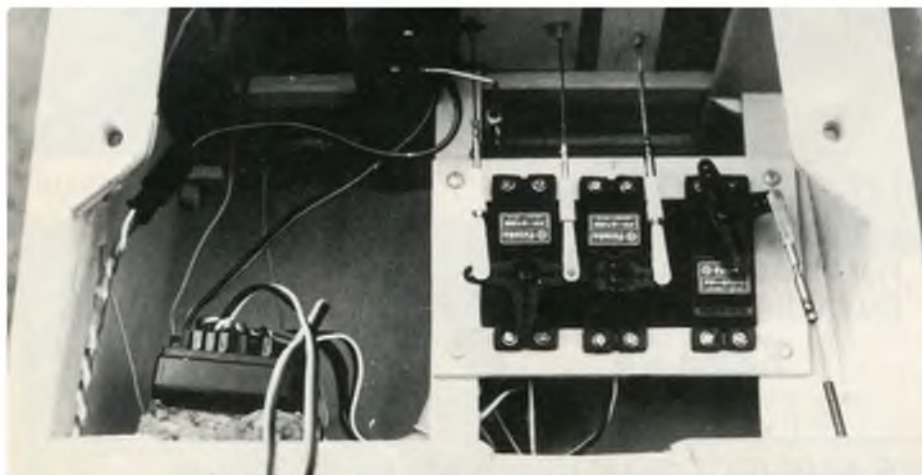
Closed loop system to the rudder and the nicely constructed sprung tail wheel assembly



Tail fin detail



The rear of the aircraft needs to be kept light



The cavernous fuselage makes for a simple and easy get at radio installation

MINICAB GY20

the whole registration taped in position over the airframe. The outline of the letters were then drawn using a draughtsman's ink pen (the adjustable blade type) and thinned paint. Whilst the outline is still wet the inside of the letter is brush painted and this then blends in with the outline. The trim stripes were added using a combination of penned outlines and masking using low tack masking film.

Lithoplate is a very useful material for scale modellers and is available in .005" and .012" thickness. Various items were made using this material, e.g. cockpit canopy and window cover frames, access panels for flying controls, cable outlet fairings etc. and these were all stuck down using double sided adhesive tape.

A useful source of miniature rivets, screws, nuts, washers, stainless steel tube etc. is A.J. Reeves (www.ajreeves.com).

Radio Installation

The radio compartment is huge, making the servo installation simple. If preferred

the servos and receiver could be mounted under a false floor in the cockpit. The battery is located in the bay immediately forward of the wing leading edge. The two servos in the wing are mounted on pieces of aluminium angle and screwed down to a 1/8" plywood plate in the bottom of the servo bay. The Rx aerial passes through a plastic tube fixed internally to the rear fuselage structure.

Weight Statistics

Painted and fuel proofed fuselage inc. tail:	2 lb 13½ oz
Wing:	2 lb 6 oz
Engine:	2 lb
R/C Gear:	14 oz
Fuel Tank:	2 oz
Canopy:	2½ oz
Undercarriage:	13½ oz
Tailwheel:	1¼ oz
Cowlings, inc. chin intake:	5 oz
Trim Detail:	2¼ oz
Propeller, spinner, prop nut:	4 oz
Total Weight:	10 lb



The cockpit hinges forward



Flap and aileron servo installation



The completed model is very attractive. The static colour pictures of the Minicab are courtesy of Phillip Kent



All flying shots, including our header image, are of the 30% version, courtesy of Peter Maw

Taxiing Trials

The Magnum had completed about 30 minutes running before installing it in the airframe. Bench running had not been too successful, with the need to run it excessively rich and a total refusal to idle being traced to a carboned-up glow plug. A new plug improved matters, but the idle was still rather lumpy and the pick-up from less than 2,500 rpm was a little hesitant.

I considered installing an on-board glow battery until I found that the low speed performance in the model was much better than on the test bench. The whole installation on the test bench was vibrating badly at low rpm, due entirely to the lack of rigidity, which was causing fuel frothing and upsetting the low speed mixture. In the model 7,500 rpm was achieved on a 16 x 6 prop, with a safe idle down to 2,000 rpm and good throttle response throughout the rev range. An on-board glow was therefore unnecessary.

With the engine idling happily the model was taxied around for a while. Ground handling was good and it was possible to turn across the wind, which was blowing at around 12 knots. Some fast taxi runs had the tail lifting, with the model continuing to track straight. At one point an over enthusiastic burst of throttle had the model airborne for a brief moment.

The reason for not flying the aeroplane on this day was because nobody had a camera available to record the event, but it was very difficult to restrain myself once the tail had lifted!

Test Flight

The test flight was planned for the following Sunday, with cameras suitably arranged. A little more engine running was completed but unfortunately the wind was gusting up to 20 knots or so. I made an excuse to wait another 30 minutes in the hope that the wind would moderate as forecast. After 15 minutes, Jim Worden kindly pointed out that a heavy rain shower was on the way, heralded by black clouds to the south, so I fired up the engine and taxied out to the runway, experiencing some difficulty taxiing across the strong wind.

The first take off was almost a disaster as I held in full up elevator and selected full throttle. The 10 lb model was airborne instantly with very little take-off run but unfortunately due to holding in the up elevator the model immediately reared its nose up in a stalled attitude and dropped a wing! However, due to the excellent control authority the situation was recovered and within a few seconds the model was trimmed out and on an even keel.

Looking back at the take off situation, I should have used the same technique that I had practised on the taxi trial, opening the throttle slowly, because the Magnum gives instant thrust when the throttle is suddenly banged open and in a 20 knot wind the take-off speed is achieved in a very short distance. With full up elevator the nose up attitude is bound to occur, with the dropped wing to the left being a result of the sudden torque reaction and a possible wind gust. Quite a large amount of down trim was fed in to prevent a very steep climb on full power, but the ailerons did not require any adjustment and on half throttle the model cruised at a very realistic speed. Several circuits were completed during which the controls were found to be precise at various

throttle settings, right down to landing speed. During this flight, the heavy shower arrived but I managed to try the flaps and no trim change was noticed with 40 degrees selected, however the reduction in speed was apparent. A low pass was completed safely at about 12 feet, despite the strong blustery wind, but by this time the rain was so heavy that I was having difficulty seeing the model and the photographers were complaining of water in their cameras! The landing approach was completed with no flap.

Almost Ready To Cover

Due to the wind strength the approach was quite slow with no tendency to stall. Unfortunately, I over-flared, which resulted in the model lifting off again after a good landing and she dropped ungainly onto the starboard undercarriage. This resulted in a nose over, breaking the prop. Apart from the frightening take off the maiden flight, which lasted about ten minutes, was quite uneventful, with the model proving to be very easy to fly. On successive flights the take - offs have been without drama; feeding the throttle in slowly and releasing the up elevator gradually means that rotation is achieved

after about 15 yards at three quarter's throttle. The aerobatic performance is very good for a model of this type, with a fairly fast roll rate if required, and the loops can be large or small. The slow flying characteristics are very good, with no tendency to tip stall, although the Minicab snaps into a very fast spin when required, using rudder, ailerons and elevator, with instant recovery when the controls are neutralised. The most impressive feature of the Minicab's performance is the ability to make a very steep approach using full flap without gaining much speed in the dive. Landings are very easy, particularly if a fast idle is maintained and the model is wheeled in rather than three pointed. My original doubts about the model being too heavy were not realised as it is quite a floater and I am sure that a good '61' will be more than adequate. The Magnum 91 has power to spare. I have really enjoyed designing and building this aeroplane and I hope that yours will give as much pleasure. I am now considering a 1/3rd scale 100" span version for a future project but will have to start saving up for a 20 cc flat twin. **RCMW**

Minicab Update

The original Minicab was designed to 1/4 scale and was built in 1982/3. The plan described in this article was originally published in the April 1984 edition of RC Model World (issue 3).

I later designed and built a 30% scale version, with a span of 96" compared to the originals 75". The larger version was featured on the front cover of Radio Modeller, February, 1990. The original was sold a long time ago and the larger model spent a lot of time in storage as other models appeared.

When Philip Kent and Peter Maw organised the Traplet scale 'Wars of the Roses' competitions a couple of years or so ago, I decided to bring the Minicab out of retirement for the events and I have been flying the model on an occasional basis since.

The larger model was based on the full size aircraft plans, as was the 1/4 scale, so the shapes and construction are true scale. An OS 120 FS powers the 1/3rd scale model, which weighs 15 lb.

The 1/4 scale model was easier to fly than the 30% version, probably due to the lower wing loading of the larger model.



Aerobatic performance is very good for a model of this type



When Philip Kent and Peter Maw first organised the Traplet scale 'Wars of the Roses' competitions, Dave brought the Minicab out of retirement and he has been flying it on an occasional basis ever since

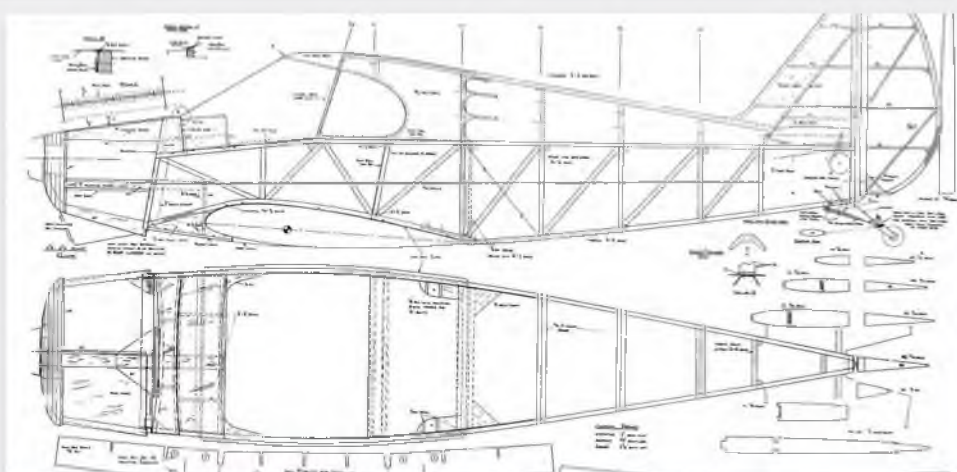
PLAN DETAILS

- PLAN NAME:** Gardan Minicab GY20
- PLAN NUMBER:** MW2001
- PLAN PRICE:** £27.50 (\$34.20)
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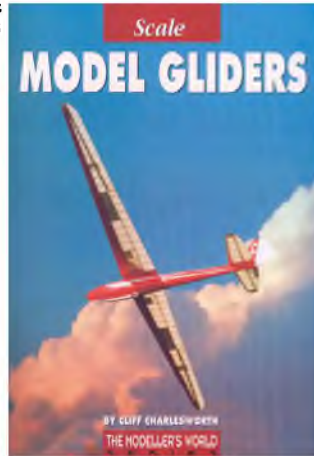
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Super EZ

James Crozier finds out if the name of this trainer from FMS rings true...



Not just a trainer, the Super EZ would make a great quick build hack model too!



There's a fully equipped R/C plane inside this box!

FM S is a now well-established manufacturer of R/C modelling gear, including a wide selection of PNP (Plug And Play) aeroplanes. Included in this line-up, which ranges from beginner models all the way to EDF jets and everything in between, is the FMS Super EZ.

The Super EZ does have some aerobatic capability but, in basic terms, I would call it an advanced trainer. The reason for this is that lately a large amount of the model planes aimed at the beginner feature all sorts of stabilisation features, as well as auto-take off and panic switches. Don't get me wrong, I think anything that adds another stepping stone for new pilots is great. This model, however, harks back to simpler times when we had none of this technology; what you do on the transmitter is replicated in the sky and nothing else!

It's for this reason that I use the term 'advanced', as you are always in total control. So, how does it perform?

What's In The Box?

The FMS Super EZ comes in a standard sized cardboard box with flaps either side allowing you to slide out the contents. The airframe and parts are nestled snugly inside an inner polystyrene section with 'bars' that hold the large pieces in place.

For ease of assembly all the hardware parts are neatly sectioned off into small plastic bags, which are labelled appropriately.

This model comes with everything you need to get it into the air, so there's also a transmitter (which I will talk more about later), as well as a 1300 mAh LiPo with an EC3 connector. A motor, ESC and 2.4 GHz receiver are all pre-installed for you. A 2S/3S



Parts spread. Not a lot of work to do pre-flight here. Super EZ is also available kit only, without the Tx, Rx, charger and battery



Super EZ comes with a mains powered LiPo charger and a FlySky FS-i4 radio system. The servo reversing and V-tail mix switches are best taped over once you have set up your aeroplane



Up and away for the maiden flight!



With its bright colour scheme the Super EZ is easy to track across the sky



This model is capable of most club style aerobatics

mains powered balance charger is also included.

Assembly

As mentioned, the vast majority of this model is pre-assembled, which is fantastic for those just looking to get in the air quickly. The main 'power-train' is all there ready to go (although you should use something to secure the receiver; I used hook and loop tape – you'll need to do this for the battery too while you have it out). However, there are



On a roll...

a few things to put together.

Firstly, you'll need to install the control horns and pushrods onto the wing. The control horns are secured via two small screws and a small piece of plastic on the top of the ailerons. This can be a tad fiddly and you need to take care not to grip the wing too tightly when screwing them down. Then, it's just a case of snapping the clevises in place.

Next up is the tail section. The tailplane is split into two parts that must be slid into place with a connecting tube/spar and then

screwed down to lock it in place. Once this is done you will again need to connect up the elevator pushrod and this time install the servo arm too. The instructions did state that it was necessary to do this process again for the rudder but with our review sample this was already done.

You also need to install the landing gear, which is a simple case of using three screws to lock it into place, taking care to get the direction right. On this model the legs are ever so slightly swept back.

Electronics And Radio

As previously mentioned you will need to secure the electronics inside the model for the sake of safety. There's a large area for the receiver to sit on, so just find a nice place where you can easily access it and secure it to the airframe and then do the same with the ESC.

You will, of course, need to check the Centre of Gravity, which is 60 mm from the leading edge of the wing. The included 3S battery is a bit of a strange shape for the long compartment, being a chunky, square 1300 mAh size that doesn't actually reach the second hook and loop strap. So I'd recommend checking the C of G and then making sure it's still OK if you plan to use any longer packs. Following the test flights I used some 3S-1800 packs, which fit in just fine.

The included transmitter is a basic FlySky branded set with physical channel reversing switches on the front. There is also a mixing switch that couples the ailerons when you use the elevator (for V-tail models), so for obvious reasons, you will want to have that switched off. We used a strip of clear tape to cover the switches so they couldn't accidentally be moved during flight.

Despite being on the budget side of things it seems a decent radio set and the transmitter only takes four AA batteries to run. However, to the best of our combined knowledge we couldn't seem to find a failsafe function. We checked with the BMFA and it is OK to use a non-failsafe radio in such a model (see the box at end of the review). So we used it for the maiden flights, allowing us to assess the whole package supplied for this review and the FlySky radio worked just fine. But we have now swapped out the transmitter and receiver for a well known brand fitted with failsafe, for our own peace of mind.

However, Super EZ is also available kit only, without the Tx, Rx and LiPo, so this is probably the better option should you want to use a different radio.



Yellow bands on the undersides of the wing are good aids for orientation

Maiden Flights

When we took the model out for its maiden flights we managed to pick a day that was icy cold, but this meant that the January showers were held at bay and so the conditions were quite favourable for flying.

With everything connected up and a range test performed it was time to see what she was like in the air.

Take-off is a breeze with the Super EZ and she gets into the sky at a decent angle of attack. You don't need a huge amount of power for general flying and this model will happily cruise around the sky at just under half stick. The yellow and blue colour scheme helps it stand out, even against murky clouds, so visibility is not an issue here.

The Super EZ would be a fantastic aircraft to learn aerobatics with. Loops especially are great fun with this model and it's certainly light enough, with enough power to really go wide and high. Rolls can also be performed fairly easily, with enough throttle applied, and manoeuvres such as Immelmans are doable despite the fairly slow roll rate.

We did take it out again a few days later at a different site with noticeably more sodden ground but this posed no issue for the Super EZ and its light airframe. There was a large amount of distant mist and cloud towards the end of our session but due to the bright colours visibility was again no issue. You can get flights of around 10 minutes with this model depending on your flying style.

Final Thoughts

If you are looking to upgrade from a trainer with 'assists' to a fully manual R/C aircraft

then the FMS Super EZ should definitely be on your radar. It's fairly easy to put together with some basic modelling knowledge, it comes with everything you need to at least get in the air and, most important of all, it's a barrel of fun!

While some may be looking for something to help them on the next step of their aeromodelling journey this is also a great piece of kit for the more experienced modeller. The Super EZ would make a great 'quick fix' flyer – just charge up a few packs and you're in the air for a few relaxing flights. At a reasonable RRP of just over £170 you can't really go wrong here. **RCMW**

Non Failsafe Radios

While we have come across small models fitted with radio systems that do not have failsafe, it came as a surprise to find that the FlySky radio supplied with this larger 3S aeroplane did not, although it is a quite capable R/C set in all other respects. So we asked the BMFA for their opinion regarding the use of such R/C equipment, particularly with regard to continued cover by their insurance:

"Provided that they [sets without failsafe] are only used for aircraft weighing less than 7kg then they are lawful to use and as such are covered under the terms of the BMFA policy (for which the primary requirement is lawful operation).

...it is certainly worth pointing out that having a failsafe is a very desirable safety feature and for some types of aircraft (over 7kg and turbines) it is a legal requirement."



A tough airframe and big wheels make this a great aeroplane for winter flying



In this picture you can see the 'quick lock' fasteners used to bolt-on the wing. Simple and quick to use – and no screwdriver required!

RC MODEL WORLD

MODEL INFORMATION

NAME:	Super EZ
MANUFACTURER:	FMS
DISTRIBUTOR:	CML Distribution (UK)
PRICE:	RRP £172.99 (£134.99 W/O Tx/Rx/Batt)
WEBSITE:	www.cmldistribution.co.uk (search FS0213 for full kit or FS0214 kit only)
MODEL TYPE:	Sport flying & trainer
CONSTRUCTION:	Moulded foam
PARTS SUPPLIED:	Airframe, brushless motor, ESC, 3S-1300 LiPo, 2.4 GHz transmitter and receiver, four servos
PARTS REQUIRED:	None

R/C FUNCTIONS

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

MODEL SPECIFICATIONS

WINGSPAN:	1220 mm (48 in)
OVERALL LENGTH:	1020 mm (40.2 in)
FLYING WEIGHT:	890 g (31.4 oz)
MOTOR SIZE:	3136/1050 KV
ESC:	20 A
SERVO:	4 x 9 g
RADIO:	4 channel
PROPELLER:	10 x 5 in
BATTERY:	3S 1300 mAh LiPo

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EDF On The Up

John Stennard keeps us updated on developments at the budget end of the electric jet scene



The Saab Draken was available in three colour schemes, two Austrian and one Swedish. My version had the Österreichische Luftstreitkräfte military colour scheme

EDF is a popular electric flight option and foam jets fill a need for the modeller who loves the concept of jet flight but does not have a deep enough pocket to go the turbine route. In addition to the cost turbine powered models have special requirements, which preferably include a good surface for take offs and landings, plus plenty of airspace.

In previous issues of 'EDF On The Up' in RCMW I looked at modifying stock foam EDF models to achieve a different flight experience. The features covered installing

alternative EDF units and fitting electric retract units.

In these articles I pointed out that most improvements also have a downside. If we fit a more powerful EDF unit the flight duration is reduced. We then fit a bigger flight pack and the wing loading is increased, resulting in a faster landing speed. A hand launched or fixed undercarriage EDF model is converted to electric retracts and the weight increase results in a reduced duration and higher landing speed.

So you may wonder, why not just open the

box and fly the model? Well, of course, when ARTF models were a new development it was quite an innovation to do just that. However, many modellers now like to take advantage of a well-designed and attractive airframe by putting in some effort to personalising their model.

In this feature I'm looking at two EDF models that, at first sight, did not look promising candidates for any type of modification but in fact provided interesting and rewarding projects.

So THINK SWEDISH – but not ABBA – and you have my first jet...

Saab Draken

Any manufacturer bold enough to produce an EDF model like the Saab J35 Draken deserves recognition. This classic Swedish jet, with its double-delta wing shape and aggressive appearance, would be a tough task to model from scratch and EDO did a fine job in producing an accurate foam version.

The Saab J-35 Draken first flew in 1955 and it was introduced into the Swedish Air Force as a fighter/interceptor in 1960. The unusual double-delta wing design had a wing sweep of 80° on the inner wing and 60° on

the outer wings. The Draken was powered by a Swedish version of the Rolls-Royce Avon and was capable of Mach 2.2.

At the time the model was released, EDO said that it was 'a plane that has not been modelled before'. Although not currently listed, I'm sure some of these models are lurking on storeroom shelves and sometimes models are re-released under different branding, so it may yet reinvent itself.

As usual I purchased my Draken with modifications in mind. I intended, if practical, to fit a set of electric retracts. With the Draken available at an attractive price, I

thought it was worth the gamble. A 1:1 thrust ratio was claimed so I reckoned that if I could fit the electric retracts the fan unit would have enough power to cope with the extra weight, and if I it couldn't then I'd have a really 'hot' model to fly!

The manufacturer mentions unlimited vertical climbing plus 'superb aerobatic flight, including inverted, rolls, loops, whatever you can dream up' – the mind boggles! With a listed take-off weight of just 450 g (15.9 oz) at least I'm starting off with a light, basic model.

When you first see the Draken one's thoughts return to the manufacturer's '100%



These small intakes were fine for an Avon but not for an EDF unit!



Four auxiliary air intakes form 'cheater holes' in the underside of the fuselage; there are four more holes on top of the fuselage! The rear cheater holes are convenient for fitting retracts

scale appearance'. This is due to the fact that there are no less than 10 'cheater' intakes. Of course, this single engine 1950s aircraft did not need large air intakes but the EDF system does! There are the normal air intakes on the wing, plus two holes in the wing leading edges, four rectangular holes on the upper fuselage and four much larger holes on the underside. The two rearmost holes on the underside are almost directly in front of the fan unit.

The quite short wingspan is just 525 mm (20.7 in), while the length is 770 mm (30.3 in). The 64 mm fan unit has a brushless 4300 KV motor and a 30 A ESC. Battery wise a 3S 1300 20-25C LiPo is suggested.

The nose wheel retract unit fitted in quite easily, although it always take some time and patience to get the steering linkage working correctly. The mains were also surprisingly easy to fit as one can work from the position of the fixed U/C. The wheel wells were also partly sorted, as when the wheels retract they could use part of the rear set of cheater intakes. I hoped that blocking these intakes with wheels would not affect the performance. As usual with many jets the track of the main undercarriage is quite narrow. This means care has to be taken when taxiing, on take-off and landing.

As an aside, I eventually abandoned the

U/C on my Tornado as at times the landings were often decidedly untidy and it put the airframe at risk. The positively worst model I ever had for untidy landings was an IC prop driven A-7 Corsair II. The U/C was exceptionally narrow and I don't think I ever did a decent landing; perhaps it needed an arrester hook!

Looking at the battery situation, I found that I could fit in either a 3S 1300 or 3S 1500 LiPo. By the time I had fitted the retracting undercarriage the weight of the basic model was 469 g (16.5 oz), which was of course slightly more than the original listing of 450 g (15.9 oz) for the take-off weight.

In addition, one of my 3S 1300 packs weighs 98 g (3.45 oz) and a 3S 1500 128 g (4.5 oz). So I was looking at a flying weight of either 567 g (20 oz) or 597 g (21 oz) – around 25% over weight. Hopefully the well-proven lift offered by the delta wing would assist, and this one is really a double delta. A power check showed 43 A at 430 W so there was no problem there. Various stores were included but I decided to test fly the model 'clean'.

The first couple of take-off runs were abandoned until I succeeded in getting the steering sorted through adjusting the travel volume and introducing expo. The

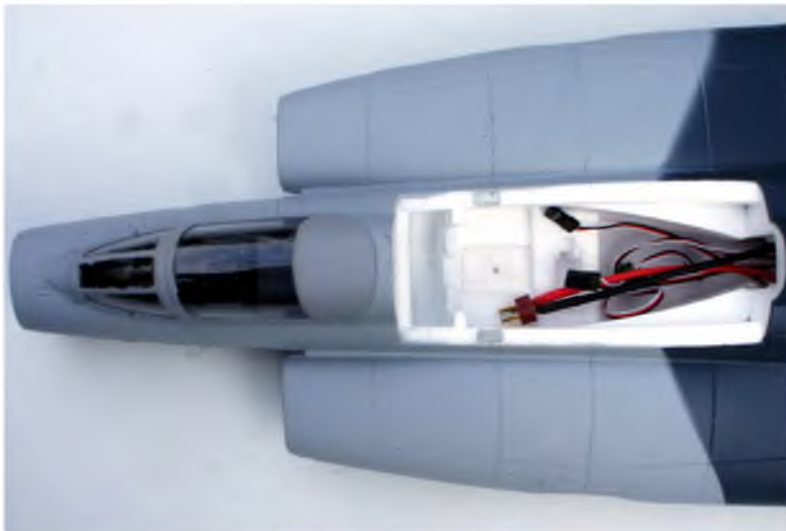
narrow concrete farm road I fly from requires accurate steering. Taking - off with a 1300 pack on board was dramatic as the Draken seemed unwilling to lift off, then suddenly shot off at a steep angle. Luckily, I had included plenty of expo and dual rates on the elevons.

I soon found that tiny amounts of roll had a big effect so I flew most of the time on very low settings. The roll rate was suitably fast and the model looped easily. The Draken was certainly fast enough to keep me happy but orientation was a real issue.

The shape, combined with the grey finish, resulted in a model that at any distance needed absolute concentration. However, she was certainly interesting to fly and to land. The very sensitive roll response meant that the landing approach required careful handling, using low rates on the elevons. Ground steering with the narrow track U/C also needed care.

Judging the touch-down speed and angle was also very critical; any mistake and the model bounced alarmingly, so grass take-offs and landings were definitely preferred to the concrete road with this model.

Moving on... I'm catching a tiger by the tail! (Remember the 'Put a tiger in your tank!' Esso ad from 1959 and on into the 1960s?)



There's not a huge amount of space for the Rx and flight pack but it's just about adequate



The wings seem minuscule but these parts are more like wingtips!



The main legs were quite easy to fit but as usual the nose unit was tricky. Narrow track undercarriages can make for difficult ground handling



Dramatic take-offs were the norm for the Draken



With the wheels up the action really starts. She was very sensitive to roll inputs, so pilot beware!

A nice inverted pass. You can almost hear an Avon!

JetTiger

Watching a friend's EDF JetTiger I wondered if I could fit electric retracts into this model? I examined his model, sized up the possibilities for a conversion and thought it was a practical proposition. The standard JetTiger is a hand launched EDF model with a compact 820 mm (32.3 in) wingspan and 620 mm (24.4 in) in length. The model uses a 64 mm fan and is designed to take a 3S 1800 LiPo.

So, with a new EDF project in mind, I ordered the JetTiger and started to sort out the electric retract system. Low cost electric retract systems are readily available from many model shops and online outlets and I usually have some spare units available from time expired (or just expired!) models. The mini size electric main units and nose wheel units were all checked out using a servo checker.

Servo checkers are extremely useful for

checking and setting up retract units, servos and ESC/motor systems and are highly recommended. There are very basic versions available but the more sophisticated type with manual, centring and cycling functions are worth looking at; again these are fairly inexpensive.

While the main retract units usually either work perfectly, or not at all, the nose wheel units are always more complex because of the steering. In most cases the mini size



Sat on its undercarriage the JetTiger looks very purposeful



On the JetTiger the main U/C units fitted in very easily, but the nose unit had to be fitted in a potentially weak area



Not a lot of room! A 3S 1500 LiPo could just be squeezed in

nose wheel unit will feature a 4 mm stub shaft with the steering arm attached. The steering arm is usually plastic and is secured onto the stub shaft with a hex socket screw. The shaft requires a flat on it so that the screw will lock it in position. Here is where a problem can occur as I have found that as the metal screw bites into the plastic tiller arm hub it can strip its thread. The threaded part in the plastic hub may only be a couple of millimetres in depth and I've also had this happen with aluminium hubs.

In the end I have had to resort to CA assistance but caution is required because if the CA creeps too far it will result in a non-steerable nose wheel!

The nose leg itself is usually fixed to the stub shaft with a double collet, which makes getting the correct nose wheel length easy. Again a flat filed on the stub shaft and leg is essential. There is some virtue in having a coil in the nose wheel to help with grass take-offs and landings but sometimes installation issues make this impractical.

Another issue with retracting nose wheel installations is the steering. All of my retract conversions have needed a separate steering servo, either because the model had no rudder or it was not practical to connect it to the rudder servo. There can also be rotational direction issues if using an existing rudder servo.

Basically this means that when planning a retracting nose wheel installation thought has to be given as to where the steering servo will be installed. Most steering systems do not now use a closed loop method for connection to the servo but employ a mechanical rotating linkage. This can be trickier to set up than the closed loop but in practice works fine.

With the retract gear sorted and tested, as soon as the JetTiger arrived I set to work installing the main units. This proved quite easy as I could use the generous size hand-grips moulded into the airframe as the basis for the wheel wells. The mini retracts I am using allow for the wheel to face inwards or outwards when the leg is down. This can make cutting and adjusting the size of the wheel wells easier depending on the model. In the JetTiger I fitted the main wheels to face outwards.

As usual the nose wheel installation required more planning. The issue with the JetTiger is that the area where the 3 mm ply mounting plate has to be installed is a fairly weak area in the structure. It's a long way forward, with very little of the nose ahead of it. There seemed very little one could do to 'beef up' the area and the model at this point was quite flexible. I continued with the retract unit and steering servo installation knowing that I might be revisiting this at some point.

The retracted nose wheel also meant that the battery area was partially obstructed. A little foam surgery resulted in a good fit for a Turnigy 3S 1300 LiPo and a tight fit for a Turnigy 1500 LiPo. With the retract gear in place the rest of the assembly took very little time to complete.

One slight concern was the top deck/hatch as this uses a ply tongue at the nose end and a plastic locking pin at the rear. The top deck/hatch is quite long and seemed to be more flexible than was ideal, as there was nothing holding it between the nose tongue and the rear pin. However, this was not something to stop a test flight.

The completed airframe weighed in at 600 g (21.1 oz) so with a 3S 1300 LiPo the flying weight would be 713 g (25.1 oz) and with a 3S 1500, 722 g (25.5 oz). The weight of the original version was listed as 520 g (18.3 oz). The first test flight was made with the 3S 1300 LiPo but later I found that after some foam surgery I could fit in a 3S 1500 pack.

These tests were done off our concrete road so the next tests were off grass. The grass was slightly longer than ideal and the surface slightly rougher but the JetTiger took off easily. I later reinforced the nose by inserting edgeways on a 1 x 6 mm carbon fibre strip into the foam. This stiffened the nose area but the long top deck/hatch



I'm taking heading directly into wind very seriously!



JetTiger takes-off very smartly



Climbing away, the model looks great



She's very happy when flying inverted



The start of a three photo story: the left U/C is hanging down, caused by a bump on take-off



Gently does it to avoid cart wheeling – or worse!



Phew, got away with that!

bending in the middle was still an issue. To cure this I positioned two high power magnets and steel washers around the halfway point to pull the top deck/hatch down and this has been successful. The top deck/hatch could be stiffened with ply or CF strip but so far the magnets have done the job fine.

I've now had many flights with the JetTiger and it's both fast and aerobatic enough to be interesting and satisfying to fly. So another retract conversion has been successful and I do really find it very satisfying to be able to raise and lower the undercarriage.

Landing any EDF model on our narrow concrete road strip is always an interesting experience and it includes elements of a carrier landing. When it's 100% perfect it's great, but when it's 99% perfect you may be in trouble! Going over the edge of our concrete deck puts you into a rough ocean (the pasture!), which will whip off the U/C straight away. So always have enough 'fuel' on board for a second attempt, and if you fail at that then you perhaps aren't heading for Top Gun!



Without strengthening, the mounting block can quite easily pull out but is easily repaired

The Logic?

Modifying EDF models can be a rewarding opportunity to add something to a stock model that is usually well designed and manufactured. If you are a casual EDF flyer then modifying your only model may not be an appealing prospect, but if you are a keen EDF pilot then you will probably enjoy some

'tinkering' and electric retract units are very inexpensive.

As mentioned earlier another obvious modification is changing the fan unit to increase the power but this can end up changing the handling characteristics of your model. In the case of the two models covered in this feature power changes were

not necessary or desirable.

Finally, two of my five winter EDF plan builds are shown. Both use 6 mm Depron and 70 mm fan units running on a 3S 2200 LiPo. No retracts are possible on these profile models but they hand launch easily and fly exceptionally well. **RCMW**



Winter build: the 'Foam Concept Jets' plan built MiG 29 is a great flyer



From the same plan source, here's an X-47B. It looks weird but handles beautifully

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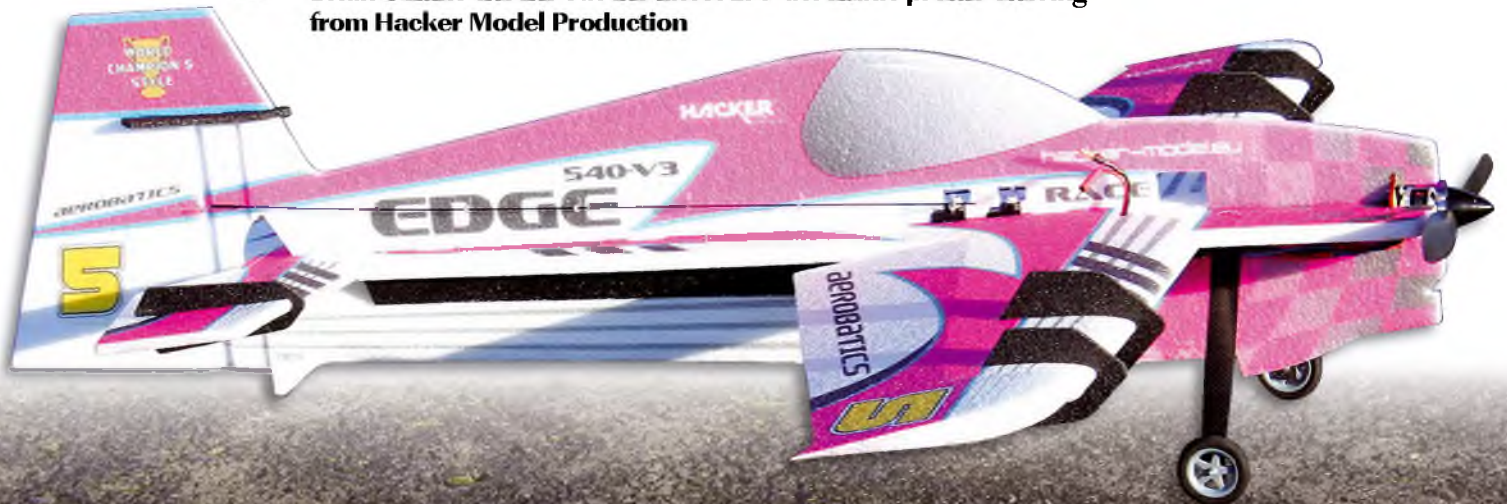
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Edge 540 V3 Toxic

Brian Collins checks out the latest EPP aerobatic profile offering from Hacker Model Production



True vertical flight is achieved due to the impressive power to weight ratio

There are several profile aerobatic and 3D models available today. Offering simplicity, relative low cost and excellent performance, profile models are very popular indeed. Hacker have been producing profile aerobatic models for some time so I was keen to give their latest offering, the profile 'shock style' Hacker Edge 540 V3 Toxic ARF, a try.

Tough Stuff

Hacker manufacture the Edge 'shock style' 540 V3 from EPP foam. But what exactly is EPP foam? EPP (Expanded Polypropylene) foam beads produce a low density, closed cell type of foam that possesses excellent energy absorption characteristics. The material has excellent 'recoverability' from repeated shocks and deformations. EPP also retains a high degree of dimensional stability when exposed to temperature extremes. EPP foam is rough to the touch and as it is very durable it can take a lot of abuse, making it ideal for model aircraft!

The EPP parts are crisply cut and are ready decorated. There are several colours to choose from. Our review model is vivid pink, which really helps with orientation when airborne.



Hacker's slim, red box does an excellent job of protecting all the components during transit



It will not take long to count the EPP foam components – there are just six!

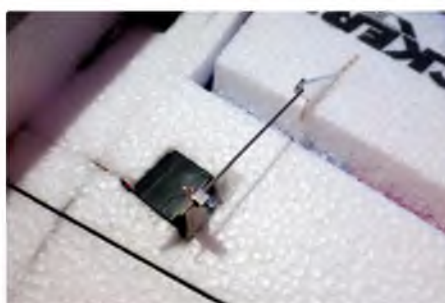


Left: Hacker motor set: 'M' Force A2826CA-15 brushless 'outrunner', with a Hacker MC-22 A ESC

Right: Four off Master S2112 9 g servos were used for the review model and have proven very reliable



Using a small 'right angle' square to ensure that the fuselage is a perfect 90 degrees to the motor mount and wing



The mounting lugs are removed from each servo. I used servo tape to secure them



My four channel receiver is secured with hook and loop tape. The black EPP fuselage strengthening former is ideal to hide servo leads behind for a neater fit



Hacker's MC 22 A ESC is mounted via hoop and loop tape on the underside of the fuselage



Hacker 'M' Force A2826CA-15 brushless motor is secured to a ply motor mount via screws. No downthrust or sidethrust is used



Clear plastic extensions, bound to the servo arms, are used to increase control throw movements

Tools

The first thing to do is to assemble a few simple tools and adhesives. Tools required are a sharp modelling knife, a screwdriver, a 2 mm drill and a steel ruler. The model is glued together with UHU POR and cyanoacrylate. It is important to use an activator to quicken up the drying process for the cyano. If you do not want to get your hands covered in glue I would also recommend the use of latex gloves.

The black and white instruction manual is A4 sized and is of the photo-build variety. I did think a couple of the pictures could have showed more detail but generally it is easy to follow the 82 build steps in the 15 pages.

Winging It

Construction starts with the wing. The two halves are glued together, with the wing then strengthened using two carbon rods that are 'sunk' into a cut made in the top and bottom of the wing. A steel rule needs to be used to ensure that the cut is straight, and the rods are then secured with cyano. The kit includes extended servo horns for all control surfaces,

which are secured in place with thread (included) before gluing with cyano. A servo is used for each aileron, held into position within a cut out in the foam. I secured each servo with servo tape. The servos are attached to the ailerons using short metal control rods. The massive ailerons also feature the carbon rod strengthening method. I then cut 'grooves' in order to sink the servo leads into the wing, being careful not to cut too deep!

Body Building

The profile fuselage uses carbon rod inserts which provide added stiffness to the EPP foam in critical areas of the fuselage. Additional strengthening from cleverly placed EPP 'formers' also help add stiffness to the profile fuselage. The motor is secured to a ply plate and inserted into pre-cut grooves.

The carbon fibre undercarriage is secured to a ply plate attached to the fuselage and is secured with screws after drilling two holes. 2 mm holes are also drilled for the wheels. Wheel 'spats' are included in the kit but as I intended to fly outside at first I did not fit them

for the first flights in case the grass would rip them off.

The servos for the rudder and elevator are positioned towards the front of the fuselage and are connected to each control surface with long carbon control horns that have five 'guides' glued along the length of the fuselage. These guides need to be lined up to ensure that each control rod moves freely.

Personally, I prefer to mount servos as close to the control surface as is possible to help eliminate any 'slop' but from a balance point of view the servos need to be towards the front of the model. However, even though the control rod for the elevator is some 510 mm (21 inches) long the elevator is extremely precise in flight. The rudder is glued into position and to complete the fuselage there are seven 'wing fences', which also glued into position.

I opted to use a four channel lightweight receiver for the four functions (elevator, rudder, ailerons and motor control), using a servo 'Y' lead to connect the ailerons in order to use a single channel.



Starboard side, showing how long the control rods are for the rudder (and elevator). However, there is no 'slop', with the model flying very accurately



Port side view. The bright colour scheme helps with orientation. I did not fit the wheel spats due to flying from grass for the first flights



An inverted pass requiring no 'down' elevator whatsoever. The model is very stable even when upside down



Using plenty of rudder input to start a knife-edge loop



Prop hanging close to the ground. If you get into a recovery situation just point it upwards and open the throttle!

Power Pack

Hacker produce a specific power set for their Edge 540 V3 models, consisting of an 'M' Force A2826CA-15 Brushless 'outrunner' motor powered via a Hacker MC-22 A ESC, and driving the included 10" x 3" propeller from either a 2S or 3S lithium battery. I used a 3-cell (11.1 V) Wild Scorpion 1500 mAh lithium battery rated at 25C, which produced a healthy 230 W with a current draw of 17.8 amps.

Due to the lightweight airframe (384 g minus battery) the Hacker Edge 540 V3 only requires 'moderate' power – less than half throttle – to hover!

Controls Throws

With the build complete it was time to set up the model. I adjusted the control throws as per the manual, which state three settings: Basic, Aerobatic and Crazy!

Ailerons: +/- 45 mm, expo 30% (basic); +/- 65 mm, expo 45% (aerobatic); +/- 80 mm, expo 65% (crazy)

Elevator: +/- 45 mm, expo 30% (basic); +/- 60 mm, expo 40% (aerobatic); +/- 75 mm, expo 50% (crazy)

Rudder: +/- 70 mm, expo 30% (basic); +/- 100 mm, expo 45% (aerobatic); +/- 125 mm, expo 60% (crazy)

Exponential can be used according to your own personal preferences but I set it as per the manual for review purposes.

Centre Of Gravity

The manual states a C of G of 235 - 245 mm. With the Wild Scorpion 1500 3S 'Nano' LiPo

battery installed I could achieve this easily with plenty of room for future adjustments' if required. After several flights at this position I can report it is absolutely accurate.

It is a good idea to line up your intended battery and test the C of G before cutting a hole in the fuselage to hold it in position.

Flying

The Hacker Edge 'shock style' 540 V3 can be flown both outdoors and indoors. However, for first flights I prefer the open spaces of an outdoor flying site, especially as the indoor hall I fly in is very small indeed (a single badminton court sized hall). Luckily I did not have to wait long for a suitable flying window as the Northumbrian weather was actually playing ball for once, so with a camera, three charged battery packs and transmitter in hand it was off to the flying site.

The cold winter wind was blowing at just 2 mph (gusting to 4 mph) so did not present any issues whatsoever. With the flight battery connected and all checks completed, including a quick taxi run to check ground handling (which is excellent due to the large rudder throw), I lined the model up into the breeze. Opening the throttle saw the Edge 540 V3 literally leap off the ground in a matter of feet and it climbed out vertical. Needless to say, and as the numbers suggested in the workshop power test, power is not an issue!

Indeed one thing that became immediately obvious is how powerful the motor/prop combination is. The Hacker Edge will hover on 50% throttle and will climb out vertically once the throttle is opened.

Once a good height was achieved I trimmed the model for straight and level



Level knife-edge flight requires surprisingly little rudder input. Even in knife-edge the model is super stable. The profile fuselage and the seven wing fences really help here

flight. It required three clicks of right aileron and nothing else. I flicked inverted to check the balance and found it was absolutely spot on. The model flies as well inverted as it does the right way up! No elevator input whatsoever is required for level inverted flight.

Let's Go Crazy!

So with the model trimmed and well balanced it was time to see exactly what the 540 V3 was capable of, aerobatics wise. The answer is, pretty much every manoeuvre that one can think of!

Due to the large rudder surface, the wing fences and profile fuselage, very little rudder input is required for knife-edge flight. With the rudder rate set to 'aerobatic' the model will perform knife-edge loops with ease.

Loops can be massive and can also be incredibly small, especially with rates set to 'crazy', which I would say is an accurate description on behalf of Hacker! I find that the model can perform every trick in the book and still come back for more.

Due to the sheer power of the motor/prop combo, prop hang is easy to perform. Even on lower rate settings the model 'hangs' very well indeed. One can hover low to the ground, knowing that the power is available to simply power up to height if required. My favourite aspect of the model is its ability to knife-edge with ease. Long, low knife-edge passes are a delight to perform!



Landing into a light breeze. Slow, yet still in full control

The 'crazy' rates that Hacker suggest are just that – crazy! The roll rate on this setting will have you losing count quickly but will appeal to people with better eyesight than I have! The Hacker Edge 540 will virtually loop in its own length on said setting too!

Basic aerobatic manoeuvres such as loops, bunts, rolls, inverted, split S's, Immelmans and Cuban 8's can all be easily made on low rates, making this model an ideal platform for learning these manoeuvres. However, switch to higher rates and the 'shock style' 540 is also a very capable 3D machine.

As I mentioned earlier it is also an ideal platform for learning to perform prop hang torque rolls as the power to weight ratio is so good that manoeuvres can be achieved at nowhere near full throttle, giving plenty of redundancy to power out should things go astray. The Edge flies very slowly, especially into a breeze, making it ideal for smaller flying sites.

I have had some successful flights in our single sized badminton court hall, in addition to outside, but it is better suited to much larger halls if wanting to fly indoors. This is another reason I prefer to fly outside flights first, so when I take it indoors I know it is already trimmed and balanced correctly.

I set the timer on the maiden flight with the 1500 mAh pack to just 4 minutes as I do not like to over discharge LiPo battery packs, especially new ones, which have only been cycled on my charger half a dozen

times prior to flying. Much longer flights can be achieved if flying moderately and with less use of the throttle, of course. Due to its excellent slow flying characteristics the landing speed of this model is incredibly slow (around walking pace) and presents no problems whatsoever.

In addition to the 1500 mAh battery packs I have also had several flights trying out larger capacity battery packs and was quite surprised to find that the Hacker Edge 'shock style' 540 can take a battery as big as a 2100 3S LiPo. Obviously, the heavier weight will affect the power to weight ratio for 3D but for general aerobatics when flying outdoors the model will handle larger packs with ease.

Conclusion

With so many profile aerobatic models to choose from it can be difficult to decide which one to buy. However, after my experience with the Hacker Edge 'shock style' 540 V3, noting the excellent build quality, straightforward assembly and above all its ability to fly so well both outdoors and indoors, I'd honestly put this one at the top of my list! **RCMW**

CONTACTS

BRIAN COLLINS
bc002d1835@gmail.com

HACKER MODEL PRODUCTION
www.hacker-model.com



Indoor flight is possible, even in tiny halls like our single badminton court. The Hacker Edge is ideal for practising your prop hang techniques!

RC MODEL WORLD

MODEL INFORMATION

NAME:	Hacker EDGE 540 V3 Race Shock Style
MANUFACTURER:	Hacker Model Production
PRICE:	RRP 61.08 Euros
WEBSITE:	www.zoomport.eu/shop (search Edge 540 V3)
MODEL TYPE:	Aerobatic/3D indoor/ outdoor
CONSTRUCTION:	Pre-decorated EPP sheet foam
PARTS SUPPLIED:	Airframe
RECOMMENDED PARTS:	Hacker 'M' Force A2826CA-15 brushless outrunner and Hacker MC-22 A ESC

R/C FUNCTIONS

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

MODEL SPECIFICATIONS

WINGSPAN:	1000 mm (39.37 in)
LENGTH:	1005 mm (39.56 in)
WEIGHT (W/O LIPO):	385 g
MOTOR SIZE:	3136/1050 KV
ESC:	20 A
SERVO:	4 x 9 g
RADIO:	4 channel
PROPELLER:	10 x 4.7 in
BATTERY:	3S 1300-2100 mAh LiPo

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HC 1384



Master Stick
Wingspan 1200mm
Weight >700g
HC 1390



HoWing 1000
Wingspan 1000mm
Weight >320g
HC 1329



Vagabond
Wingspan 1510mm
Weight >480g
HC 1220



EDGE 540 V3 Toxic
Wingspan 812mm
Weight >145g
HC 1381



Fun Master
Wingspan 1300mm
Weight >700g
HC 1391



HoWing 1200
Wingspan 1000mm
Weight >330g
HC 1330



Bergfalke II/55
Wingspan 2000mm
Weight >780g
HC 1229



MX2 Toxic
Wingspan 812mm
Weight >145g
HC 1382



Cool Master
Wingspan 1650mm
Weight >1950g
HC 1392



P 51-D Mustang
Wingspan 840mm
Weight >340g
HC 1308



Blanik
Wingspan 2000mm
Weight >780g
HC 1225



MXs-804 Vector
Wingspan 804mm
Weight >210g
HC 1361



Bejanca Super Decathlon (elektrik)
Wingspan 2000mm
Weight >3950g
HC 1008



Focke-Wulf FW 190D
Wingspan 840mm
Weight >340g
HC 1307



Luňák
Wingspan 2000mm
Weight >780g
HC 1226



EDGE 540 v3
Wingspan 1000mm
Weight >390g
HC 1702



MX2
Wingspan 1200mm
Weight >950g
HC 1339



Mitsubishi A6M2 Zero
Wingspan 840mm
Weight >340g
HC 1310



FOX
Wingspan 2000mm
Weight >780g
HC 1227



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The 400

With this issue RC Model World celebrates its 400th edition. Kevin Crozier looks back at the first ever issue and some other milestone editions

Reaching this magazine's 400th edition is quite some achievement and one that everyone here at Traplet Publications is rightly proud of. We thought that you might enjoy taking a step back in time to take a look at the state of R/C modelling back in the early 1980s and how it has evolved from the viewpoint of RC Model World as we reached each one of our subsequent centennial editions.



400
400th ISSUE



First Edition

The cover date of our first edition is January 1984. The magazine was 84 pages in length and it was published from Traplet's original base in Suckley, Worcestershire. It would have been 'cut and pasted', with the pages laid out by sticking waxed paper strips of text and pictures onto stiff white paper – there was no desk top publishing back then! Among the short list of Special Contributors is one chap who has stuck with us right up to the present day. So please take a bow, Peter Miller.

Our very first article was an interview with a top scale modeller, Eric Fearnley, who described his eighth scale model of the DH4 biplane in American 'Liberty Bomber' livery. This was followed by a page dedicated to the Society of Model Aeronautical Engineers (SMAE), the forerunner of the BMFA today.

These days, with the advent of small crash resistant helicopters and drones, lots of die-hard fixed wing pilots have started to get a taste for rotary R/C models, hence most are a lot more tolerant of model helicopters, but back in 1984 they were an acquired (and very expensive!) taste. RCMW attempted to put a more positive spin on things (sorry!) by printing an article about how to get started with model helis, then still mostly semi-scale machines.

The magazine jets off to report from what was then the most important R/C trade show of the year, the Tokyo Toy Fair. Japanese model companies were very much in the ascendency at that time, especially those that produced R/C sets, such as Futaba, JR Propo and Sanwa. OS and Enya had the lion's share of new engine releases, with four-stroke engines becoming increasingly popular. ARTF models were also starting to appear from companies like Pilot and Kyosho, but Chinese companies were nowhere to be seen.

DIY electronics was still a popular subject and details were given for a 12 V field charger for topping up the 500 mA NiCad cells used in R/C sets of the time. A bit of full size interest always seems to be appreciated by our readers and so it was back then, with a progress report on a brand new racing plane, the Tsunami.

It's understandable that the magazine wanted to emulate other popular R/C magazines with its own set of regular contributors; to this end Peter Miller was engaged to write about glow motors in Engine Bay, while Ben Buckle provided his Vintage View on old timer models.

The honour of the first ever RCMW kit review went to the Scorpio 'Aquila 200', a three channel sailplane distributed by MacGregor Industries. Next up were model boats and then R/C cars. By covering these subjects the magazine was truly reflecting its title but it wasn't long before Traplet decided to concentrate on separate magazines for these disciplines, and model helicopters too!

An article on The Theory Of Flight was followed by a profile of a leading glider pilot, Sean Bannister. Finally, Dudley Patterson (of Flair Products fame) put the first issue to bed with his Club 20 feature.

'Then and now' comparisons are always fraught with danger but it's clear that articles were generally shorter than now and with far fewer pictures. And everything, apart from the cover, was in black and white, although the odd bit of 'spot colour' was employed to liven things up, such as the red border around the Engine Bay's title block.

One thing that does stand out is the large number of adverts. Anybody and everybody who was making a business from the R/C model trade in the UK appears to be present in some way, all using the power of the press to promote their goods. How different things are today in this internet age. Thankfully there are still just enough enlightened advertisers who appreciate the highly targeted audience that the few remaining R/C magazines reach. Without them it will be smartphones and tablets all the way in the future...



DIY electronic projects were popular



Peter Miller has been contributing since Issue 1. Note the use of red as a 'spot colour' around the title



RC Model World used to feature models cars and boats

Issue 1 Advertising Highlights

- Enya engines (then distributed by Ripmax)
- Irvine two-stroke glow engines
- Flair Products kits, with the 'Legionaire' and 'Baronet' pictured
- Super Tigre engines, sold by Mick Wilshere and promoted with Hanno Pretzner, the then World Aerobatic Champion
- Micro Mold kits and accessories
- SP113 Laminating Resin
- P.A.W. diesel engines
- CalderCraft kits, including the 'Super Phoenix' glider (I still have mine!)
- Stanley 'Apprentice 60' trainer
- Model Flight Accessories 'High Sierra' 2M glider with power pod
- Futaba 7FG radio system

- Digifleet Custom III FM radio system
- Mardave 'Marauder' racing buggy
- Complete-A-Pac 'Boeing B52'
- Dunham Engineering replica 'Orwick 64 & 29' spark ignition engines
- 308 - Henry J. Nicholls & Son, Holloway Road's famous model shop
- Galaxy Models kits, featuring the 'Escort' and 'Magician' (Galaxy kits are now sold by Traplet)
- Dick Edmonds Model Supplies 'Algebra 3M' thermal soarer
- Sun Lane Engineering Co. Ltd. 'Aerolight Wheels'
- Electronic Developments 'Super Hunter' and 'Viking MkII' diesel engines
- MacGregor/JR 'Apex' radio system



100th Issue

If our calculations are correct then RC Model World reached its 100th edition in May, 1992 (based on counting back from the first edition that we could find with an issue number, in 1994!)

This was the early days of desktop publishing and I think it's fair to say that Traplet were one of the first model publishing companies out of the blocks with such technology. I was Editor of RCM&E at the time and I well remember casting envious looks at Traplet magazines whilst still getting sticky fingers from dealing with those old

fashioned waxed strips of text!

Traplet Publications were now trading from offices in Upton-upon-Severn and the magazine was edited by Simon Rodway. Some of our regular features had established themselves, including Take Off, Diary Dates and Shop Window.

This issue starts part way through a series called Simply Aerodynamic by Dr. John Gibbings before giving way to a large gallery of adverts. Editorial resumes on page 28 with the fourth part (!) of a report from the F3B World Championships, which goes to illustrate the comparatively high interest in

thermal soaring (or at least that class) back then; I doubt whether a four part competition report on any discipline would go down well with our readers now!

Jet Stream by Mike Cherry aimed to brief about all the exciting developments happening with ducted fan jets. It features lots of OS and Rossi DF engines but there's no mention of gas turbines; the excitement of 'real' jet modelling was still to come, at least for British modellers!

Interest in electric flight was still building but it's interesting to note that the Charged Flying column only filled one page, text only!



The Nuremberg Toy Fair fills the next few pages; solar powered planes and Graupner/JR's gyro assisted cyclist dominate. I had a wry smile when I read: "Herr Graupner mentioned that there could be a model able to start by itself, fly and land without any help from the transmitter..." Some of the latest drones can do exactly that these days!

Still at 84 pages and with no pull-out plan it fell to Terry Moore's Stinson Junior to provide the Plan Feature for this issue. A rather attractive cabin monoplane, the plan is still available from the Traplet Plans Service, order code MW2371. Perhaps it's time for a reprint of this article?

Much missed Small Model Association co-founder (or should that be non-founder?), Dereck Woodward catches up on small model matters with Weekend Pilot, while Duncan Hutson offers scale modelling advice in Scale Flyer; in this issue he shows how to build up wing fillets.

The first kit review is courtesy of Harry Gilkes, who was tasked with building and flying the Revolution 'Enigma', a low wing aerobat with a wedge shaped fuselage – an 'on trend' design feature in the early 90s.

'New Lamps For Old' showed how to refurbish the brushed motors used in electric

models; the brushless motor revolution was just around the corner but like most 'new' things such motors, complete with matching speed controllers, were very expensive and they were not widely used by club pilots. How times have changed!

Mike Cherry returns, this time with a prop plane in the form of a Dynafire Spitfire. Of all built up construction, this kit resembled a lot of Spitfires of the era, having enlarged tail feathers and outboard main wheels; not one for Supermarine purists!

That concludes the editorial, but the magazine is still bursting with that life-blood of magazine publishing, advertising. Like them or loathe them, advertisements really do keep things going at publishing houses like Traplet and there's no denying that this period was a 'golden era' for the model press.

Many pages were still in black and white but there are many more instances of 'spot colour', with highlighted areas in red, blue and magenta. Full colour printing was making in-roads too with extra colour sections having been added to tempt far-sighted advertisers to add that extra bit of impact when promoting their new products.



Maybe it's time to revisit the Stinson Junior plan (MW2371)?



I'm not sure how well a four part competition report would be received these days!



By this time RCMW had more colour sections, mostly spot but some articles were in full colour too, such as Scale Flyer

Issue 100 Advertising Highlights

- Super Custom engines, distributed by J Perkins
- Sussex Model Centre, who still trade from a large shop in Worthing
- Glens Models 'Sukhoi Su-26M'. At 1/4 scale and 76 inch span these were seen as pretty large models at the time
- Wings & Wheels Model Spectacular then in its 6th year. Still going strong!
- Multiplex Commander mc 'tray' type R/C transmitters
- Radio Active 'Graphik 40 & 60' aerobatic models
- Inwood Model Supplies 'Improver' kit
- Arrow Models, selling Quadra and A&M/Sachs Dolmar petrol engines
- Cranfield 21st R/C Model Expo
- 'Radio Controlled Model Aircraft', seventh edition of a cloth bound book sold by Swansea Models & Hobbies
- Marvic Models aerobatic kits, including the 'Joker', 'Super Dalotel' and 'Super Challenger'

- Morley Helicopters, featuring the MXB Sport, Hughes 300 and MX Ranger
- MFA Sport 500 helicopter
- Radio Active model accessories
- EZ F-16 kit, distributed by Irvine Engines

- ASP engines, then distributed by MacGregor Industries (now by Just Engines)
- Plus pages and pages of model shops, with almost three pages of shops listed in the Shoppers Directory! Almost every major town had one





200th Issue

By the September issue in the year 2000, RC Model World had grown to a whopping 148 pages. Peter Dawson was the Editor at the time and he always had a big smile on his face whenever I met him, but putting together a magazine that big must have been very stressful. My maximum has been 132 pages and I always liken editing a magazine to being on a carousel – just when you have put one to bed another issue comes along and you have to jump back on the merry-go-round!

Peter had some help though in the form of Steve Harper as Editorial Co-ordinator, who still sub-edits the articles before I take a look (he also compiles our Shop Window and Diary Dates features). The magazine also had an Editorial Project Co-ordinator in the person of Tony van Geffen, who regular readers will be familiar with... (See the 300th issue!)



Our scale column, now called 'Best In Scale', is an example of the widespread use of feathered edges on pictures with overlapping text. These days we try to avoid running text over pictures to make the magazine easier to read

Despite the celebratory nature of this issue it starts on a more sombre note with news of the death of Dave Jones, the Editor of Traplet's gliding magazine, Quiet Flight International.

By this time Shop Window had taken up residence close to the front of the magazine but largely consists of book and DVD reviews. Here we also see the first mentions of email addresses and just a few websites; not every company had one but times were a-changin'...

Phillip Kent had taken over as our scale correspondent with Best In Scale, now in full colour. The style of the magazine had changed too, with lots of pictures having feathered edges and text running over the edges. New software features were available to the graphic designers and they made plenty of use of them, as well as making full use of bold colours; the magazine is a riot of red, blue, orange and yellow backgrounds and all shades in-between!

The advertisers were not immune to resisting the more outlandish effects possible when using the latest DTP software and some of the adverts also need sunglasses when viewing them! Thankfully graphic design has become a little more restrained these days.

Besides celebrating the magazine's second century it was also time to commemorate the 60th Anniversary of the Battle of Britain with a large section of computed generated three views of RAF and Luftwaffe aircraft.

In 'Charged Flying', the electric flight column, one can see the progression to using more powerful specialist motors, including brushless types, from companies like Aveox and Plettenberg, with slimmed down models crammed with up to 24 x 2400 mAh Nickel chemistry cells. NiCads still had the edge in their ability to 'deliver amps' but NiMHs were catching up fast.

Our late friend, Steve Dorling presented the engine column, now called Powerhouse, where he showed how to replace engine bearings. Next up is a review of the Sukhoi Su-31, a .40-sized ARTF scale aerobat from Kyosho – the age of the 'Almost Ready To



The main plan feature was for a 99 inch span model of the Bristol Type 138A for .90 four-stroke power

Fly' Extra/Edge/Sukhoi/MX2 had well and truly arrived!

Alasdair Sutherland continued to offer aeronautical advice in his Aerodynamic Forum and Stuart Marsden had taken over the old timer brief with his Marsden's Musings, while Soarers' Slot was chaired by Carl Trollope. Sleek, all moulded sailplanes with sheaf noses were the star turns.

Model jets were now regularly powered by gas turbine engines and this was the era when, if one turned up at the flying field, everyone stopped to watch. Turbines are now more common at suitable flying sites but they no longer have quite the same scene-stealing potential. RCMW's column about such models was simply entitled 'Jets' and it was written by Dick Spreadbury of Classic Jets fame.



The original Flight Lines were event reports bundled together at the back of the magazine

Mike Proctor was yet to migrate to taking over Soarers' Slot; instead he offers advice on building airframes in the Construction Zone.

'Fly Past – 200 and counting!' is much the same type of feature that I am writing here, looking back at past issues. Onwards then to Test 'E', a pull-out plan for a fun-fly, slow-fly design for 6 x 120 mAh cells and an Ikarus 280 geared motor. The regular plan feature follows, being a 99 inch wingspan scale model of the Bristol Type 138A high altitude monoplane for .90-size four-stroke engines. The plan number is MW2832 if you want to look it up on the Traplet Shop website.

Glider's Guild is yet another gliding column, which describes a DIY tow-line winch. This is followed by Web Watch, at a time when modelling websites were still somewhat of a novelty. Looking at some of the basic layouts it's amazing to think of how website design, and how we can interact with them, has progressed in the past 16 years.

Next up is ARF Heated, which shows how to repair a foam EDF F-16 jet, complete with a glued-on nose. I've got a foam F-16 that looks just like that!

Aeromodeller's Anonymous, a compendium of modelling topics by the not so anonymous Nigel Haves and Graham Iredale, shows how to use aquatic pipe fittings as part of

your fuel plumbing, whilst Bright Ideas was used to pass on building and modelling tips supplied by our readers.

This issue also saw the very last Weekend Pilot column written by Dereck Woodward before he 'ambled over' to our then sister magazine Electric Flight International (later to become Q&EFL).

The regular columns just keep coming (no

wonder Pete needed all those pages!) with Pattern Patter, the forerunner of our current Inside Loop aerobatics feature. Nearing the end now and we reach a review of an electrified Zagi flying wing before arriving at the Flight Lines section at the back of the magazine. Events covered were the Old Warden 'Model Flight Festival', the Dortmund show, three indoor meetings (still quite a

rarity back then) and the Longhorsley show.

My overall impression, apart from the high page count and the vivid design techniques, is how the smaller advertisers, of the cottage industry type that had been the backbone of the UK model trade for so long, had started to be replaced by larger one, two or even three page adverts from large shops and distributors.

Issue 200 Advertising Highlights

- Kyosho 'Supermarine Spitfire 40', a built up and finished ARTF kit
- Thunder Tiger Trainer 40 Mk II, also ARTF
- Model Zone shops, the retail arm of Amerang (now part of Ripmax)
- Hobby Stores shops, the retail arm of Ripmax
- Shrewsbury Model Centre 'Crusader Swift' 72 and 100 inch glider kits
- Ikarus 'Slow Fly' kits (Bleriot, Eindecker and Taube), and Aero-Fly, an R/C flight simulator for Windows 95/98 with 3D rendered scenery
- R/C Scale International, promoting one of RCMW's then numerous sister magazines
- ZAP adhesives
- Pegasus Models, who had begun to build a solid reputation for selling SIG, Balsa USA and other American kits
- Gliders Distribution, a popular source of Graupner products
- JB Aviation, who were selling the ATS Kite trainer, the ATS SuperSport and a DH71 Tiger Moth monoplane

- The International Model Exhibition, Halton, a much missed family model show at the home of the RAF's 'Brats' (apprentices)
- MainLink Systems 'Delta 4-2000' four-channel charger
- JR Propo radios with Advanced Digital Trims, using flexible fixed buttons instead of moveable trims. Now pretty much universal
- Great Planes ARTF kits

- CSM V10 3-in-1 R/C Flight Simulator. One of the original sims but with 256 bit graphics that looked a bit bland compared to newer 3D rendered packages such as the Ikarus Aero-Fly
- Plus pages and pages of Traplet house ads. The company was not shy of using its own resources to promote its books, DVDs and magazines!



The magazine starts with a spread of congratulatory messages from the model trade and model clubs (there's even one from yours truly whilst working in distribution!) Shop Window is now a much more product based affair before the editorial moves onto a review of SebArt's Shark S 30E trainer.

Peter Miller presents Renegade, a simple to build 51 inch span pattern aerobatic model for around 32 size engines and a function R/C designed by Peter Miller.

Another review follows, this time for Alfa Model's F-86 Sabre EDF jet before John Stennard updates us on small and indoor models with his Light Flight column, which is still going strong and is now in its 16th year – well done, John!

Next, editor Tony offers his own retrospective but limits his thoughts to issue number one (I hope someone is looking at this in another 100 issues time!)

There then follows a report from the Oudtshoorn scale meeting in South Africa before a review of an Air Race Truck – an R/C flying lorry!



Peter Miller's Renegade plan (MW3373) was recently the subject of one of Peter Maw's 'Building From Plans' series



Traplet still have an office in South Africa and our readers out there even have their own edition of the magazine. Many thanks for your support

300th Issue

RC Model World celebrated its 25th Anniversary with the 300th edition dated January 2009. The pagination was reduced to a more manageable 132 pages and the magazine was now edited by Tony van Geffen, with Chris Bowler as Assistant Editor (I wish I had one of those!). Traplet Publication had moved to larger premises in Pendragon Close in Malvern.

Tony Stephenson, Traplet's Managing Director since the start of the company, had now been joined by his son, Tom as Operations Director. Tom is now our MD and Tony is Traplet's Chairman.



In this article Clive Hall uses a doughnut to illustrate the signal distribution of a hinged 2.4 GHz aerial in different orientations

The pull-out plan in this issue is a double sider, with Peter Rake's SE5a for a GWS IPS geared motor (plan number MW3379) followed by Cruiser 40, a 41 inch EP cabin sports model by Andrew Reid (MW3376). Next up is a report from the Scottish Aeromodellers Association Airshow near Stranraer, followed by a rather more noisy affair, Jet Power, the annual R/C jet jamboree that is still held each year in Germany. Next, Clive Hall uses a doughnut to illustrate the signal distribution from a 2.4 GHz transmitter! Another foam jet gets some exposure, this time Graupner's Eurofighter Typhoon, piloted by long term reviewer, Josh Spiers. Rotary Wings, the magazine's heli column, written by Richard Morris, visits a wet and windy Charmouth Fly-In (a regular haunt of mine back then and sadly an all too familiar weather report!) Then it's back for another review, this time something a little bit different as the Editor shows how to add flaps to a Multiplex Mentor trainer. Just before the final article, a report from the Southern Model Show, Gray pops up with one of his popular sport and retro articles using 'The Sport Channel' moniker. Gray is another long term contributor who

continues to provide his monthly SC column for RC Model World. Many thanks for all your support, Gray. Impressions? While built up and pre-covered ARTF kits are still popular the dominance of moulded foam models is well under way, helped by the widespread availability of affordable brushless motors and LiPo battery packs. Apart from plan features built up models are very rare. The large number of semi scale Electric Ducted Fan kits available is testament to the popularity of small foam jets but there are also plenty of prop driven warbirds being made from foam too. In the intervening period between issues 200 and 300, Spektrum had revolutionised radio control flying with the introduction of 2.4 GHz R/C sets, backed by a 'tour de force' marketing campaign by Horizon Hobby that hit most of the other long established R/C manufacturers for six. Most have bounced back now but some took longer than others to respond to this new method of radio control; in issue 200 there was still plenty of 35 MHz equipment still being advertised by the model shops.

Issue 300 Advertising Highlights

- Top Gun moulded foam jets and warbirds, distributed by CML
- Hawk 1500 V-tail gliders from Thunder Tiger
- Flying Legends Mustang and Spitfire – 900 mm span foam warbirds
- Reality Craft 'PlaneMaster' R/C flight simulator from CML
- Twister Skylift V2 – a Chinook style twin rotor helicopter from J Perkins
- Weatronic Dual FHSS – a 2.4 GHz Tx module and dual receiver
- Century UK sub-1M range of foam semi-scale RTFs, complete with Tx and Rx
- Flying Toys – an alternative twin rotor heli, this time by Silverlit
- Avicraft in Bromley – Panic biplane kits
- SebArt built up ARTF kits, including the Katana S120E and Angel S30E
- Spektrum DX7e with 11 ms frame rate and 2048 resolution

- Motors & Rotors advertising the Power Box series of power control systems
- Saito four-stroke engines, distributed by MacGregor Industries
- Hangar 9 P-51 Mustang PTS, a warbird style 'trainer' complete with engine and radio

- Fly R/C – an American magazine that has only recently ceased publication
- Multiplex Blizzard 1.4 metre 'hotliner'
- Optifuel glow engine fuels
- Graupner mx-16 iFS (Intelligent Frequency Select) radio system – a forerunner of Graupner's 2.4 HoTT technology



Here's To issue 500

That sums up my retrospective of the last 30 plus years of RC Model World. I hope you have enjoyed taking a look back at some of our past issues and I do hope that you will still be enjoying reading RCMW as a print magazine when it reaches its 500th edition in another eight years or so. **RCMW**





Powerpal 2.0

Interested in a new charger but want something a bit less sophisticated than the Touch Duo we reviewed recently? Etronix have something for you too! James Crozier takes a look



The balance board and charge leads connect to the side of the unit

It can be quite daunting when looking at chargers for our batteries. There are all sorts of different types and sizes of charger; some are made for a specific purpose and others do practically everything.

On top of these differences there are other things to look out for, such as build quality and durability, as well as the actual hardware. Do you want a touchscreen or actual, physical buttons? And should they 'click' or be the spongy, gel type? These days some chargers can even be controlled from your smartphone (although I would always recommend keeping your batteries in sight at all times when charging!)

The Powerpal 2.0 from Etronix tries to

solve some of these issues; it's an 'all-in-one' charger and discharger, and at just under fifty pounds it might just be what you're looking for if you are in the market for a budget charger.

What's In The Box?

Powerpal 2.0 comes in a neat flip top box. Inside all the components are neatly tucked away into divisions created by folded cardboard, which keeps everything tidy if you're the sort of person who likes to keep their chargers in their boxes.

Of course, you get the charger itself, which has a nice blue and black design. It is made from plastic, which is what you would expect

from such an affordable piece of gear, but it doesn't feel cheap. The buttons are made out of the same sort of plastic but again they feel sturdy and tight; there should be no danger of buttons falling out here after repeated use.

Powerpal 2.0 features a nice, bright screen, which makes seeing what settings you are inputting a breeze. To set up a charge all you need to do is use the buttons to cycle through the battery type and type of charge. Then it's simply a case of cycling through each option (capacity, cell count etc.)

Also included in the box is a lead fitted with a UK plug for powering by mains AC, and a jack lead with small croc clips for connecting to a DC source when field charging.

Etronix also provide an output lead fitted with a Deans style connector, as well as an XH balance board. However, if you use different connectors on your charge or balance leads then suitable alternative types are widely available. Etronix's UK distributor, CML, offer a large range of different types of charge leads and balance boards, so it's well worth a look on their website.

Obviously, how you set up a charge depends entirely on your batteries and there is a multitude of modes to choose from. But for most R/C modellers the main use for this unit will be charging and discharging up to 6S LiPo's, which the Powerpal 2.0 does without fault.

It may not have some of the latest features that more expensive chargers do, such as a touch screen or remote smartphone control, but it does the basics very well and easily. At just one penny away from fifty pounds this charger is not to be sniffed at! **RCMW**



Above: Supplied with the charger are AC and DC power leads, a Deans style charge lead, an XH balance board and decent instructions

Right: A flip top box keeps the charger and all its leads safe and close to hand

RC MODEL WORLD

PRODUCT INFORMATION

MANUFACTURER: Etronix
DISTRIBUTOR: CML Distribution
WEBSITE: www.cmldistribution.co.uk
 (search ET0201)
RRP: £49.99

FEATURES

- Dual power adapter for AC/DC voltage
- Integrated LiPo battery balancer
- Storage modes for LiPo battery
- Discharge function
- End voltage control
- Capacity limit
- NiXX battery cycling
- Temperature sensor port
- LiHV Mode

SPECIFICATIONS

AC INPUT VOLTAGE: 100 V - 240 V
DC INPUT VOLTAGE: 11.0 V - 18.0 V
CHARGE POWER: 80 W
DISCHARGE POWER: 5 W
CHARGE CURRENT: 10.0 A
DISCHARGE CURRENT: 2.0 A
BALANCE CURRENT: 400 mA/cell
BALANCE CELL COUNT: LiPo/Li-Ion/LiFe/LiHV
 1-6 series, NiMH/
 NiCd 1-15 cells
PB BATTERY VOLTAGE: 2 - 24 V
DIMENSION: 130 x 115 x 61 mm
WEIGHT: 380 g

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See your ideas printed!

The Fisher Delta 1.0 3D Printer is everything you need to print whatever you can imagine!

This fantastic **table top 3D printer** has everything you need to start printing straight away.

Designed and developed in the UK, this printer is designed for reliability, quality and durability. It is simple to use, producing an infinite number of printed parts and components.

Supplied in kit form for only £399 with easy to follow online instructions. All electronics are supplied and ready to use with pre made wiring harnesses – no soldering required.

Additional filaments, parts, heat beds and many more accessories available!

Full specifications, videos of the printer in action and further information is available at www.trapletshop.com

*£399.00 includes VAT but is subject to P&P



SPECIFICATIONS

Firmware

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

Software

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

Materials

- Standard 1.75mm diameter filament (PLA Plastic)



3D printing is the perfect way to make bespoke scale details for all types of models. The builder of this big 1:3 scale RC model of a Druine D-31 Turbulent aircraft needed to represent the parts of the VW engine that protrude

from the side of the cowling. He was able to supply reference photos and drawings of the full-size engine, so creating a 3D printable model was fairly straightforward. He'll need to do some sanding/finishing before painting and detailing it, but it should look just right when installed in the model.

Full details of the Fisher Delta 1.0 3D Printer are available at www.trapletshop.com or phone 01684 588599

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SCAN WITH YOUR SMART PHONE

Pick Your Own Plan

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

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

How It Works

For each 'PYOP' feature the Editor will hand pick four plans from the Traplet Plans

Pick Your Own Plan - Please quote offer code **400PYOP** when placing your order

Service (which now includes plans from the MyHobbyStore range, including plans originally published in magazines such as RCM&E and Radio Modeller). Three of the plans will come from the established categories on the Traplet Shop website, such as Scale Plans, Electric Sports Plans, Powered Sport Plans etc. And the fourth will be a 'lucky dip' taken from a random fourth category.

The offer of 50% off is based on the full RRP as shown on trapletshop.com and to

make it even more appealing we are going to start the ball rolling by allowing you to combine more than one offer featured in any one 'PYOP' feature. So if all four aeroplanes featured appeal to you as potential building projects then you could save up to a whopping £46.50! That's right – almost £47 in potential savings, which you could then spend on a laser cut wood pack or cowl and canopy for one of your chosen models!

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

“Jet style but with lots of balsa to bash!”

From our Electric Sports Plans category: Razor 90

A classic sports jet design from the building board of Shane Harding, designed for 90 mm electric ducted fan units and a 5S 5000mAh LiPo. The build of this model is straightforward, making this a cost effective entry into the high-speed world of EDF jets.

Wingspan: 50" / 1270 mm

Power: Hacker B50 and Wemotec 90 mm fan unit or similar

Battery: 5S 5000 mAh LiPo

Radio Functions: Throttle, Ailerons, Elevator, Rudder & Undercarriage

Length: 54" / 1370 mm

Matching items include:

Laser Cut Wood Pack (WP3636)

PETG Canopy (CA3636CY)

ABS Air Intakes (CA3636INT)



Order Code: MW3636 **RRP:** £18.50

Please quote 'Pick Your Own Plan' offer code PYOP400 to receive your PYOP discount of **50%** off the RRP plan price. Tel: +44 (0)1684 588599 Website: www.trapletshop.com

“A detailed glider plan for anyone seeking a large scale soarer to build”

From our Scale Glider Plans category: HW-4 Flamingo

Yet another superb scale replica from Chris Williams, the unusual 5 metre wingspan Flamingo is both elegant and a fine flyer whether aerotowed or launched from the slope.

Designer: Chris Williams

Radio Functions: Rudder, elevator, ailerons, tow release

Wingspan: 196.85" / 5 m

Weight: 8.6 kg / 18.95 lb

Matching items include:

PETG Canopy (CA3463CY)

Laser Cut Wood Pack (WP3463)



Order Code: MW3463 **RRP:** £32.50

Please quote 'Pick Your Own Plan' offer code PYOP400 to receive your PYOP discount of **50%** off the RRP plan price. Tel: +44 (0)1684 588599 Website: www.trapletshop.com

“Another rewarding project for those with good building experience”

**From our Brian Talar
Scale Plans category:
DH98 Mosquito PR.XVI (81")**

Designed by Brian Taylor, this beautiful 1/8th scale, 81" wingspan model is a major but very rewarding project (but not for the beginner!). The plan builds into a PR.XVI photo reconnaissance aircraft and details of the location of the camera ports are shown on the plan, as are details of how to make a scale retractable undercarriage. The model is of all-wood construction but a moulded cockpit canopy, engine cowlings and undercarriage doors are available, as are metal spinners. A laser cut wood pack is also available that contains most of the shaped wood parts needed such as fuselage formers and wing ribs but you will need to buy additional sheet and strip wood to complete the model, as well as all the hardware needed. The model was designed to be powered by twin four-stroke engines but experienced modellers have successfully converted it to electric power.

Wingspan: 81" / 2.057 m
Power: Twin .40 - .50 cu. in. four stroke glow engines
Radio Functions: 6 - 7
Scale: 1:8



Order Code: MW3340 **RRP:** £27.50
Please quote 'Pick Your Own Plan' offer code PYOP400 to receive your PYOP discount of **50%** off the RRP plan price. Tel: +44 (0)1684 588599 Website: www.trapletshop.com

Matching items include:
Canopy Set (CA3340CY)
Pair Of Fibreglass Cowls (CF3340CL)
Pair Of Fibreglass Undercarriage Doors (CF3340UC)
Aluminium (Single) Spinner Set (CS3340SET)
Laser Cut Wood Pack (WP3340)

“A simple to build biplane. A true aeromodelling classic!!”

**From our Electric
Scale Plans category:
Tiger Moth**

A lovely, easy to build classic scale model for affordable electric power set-ups. Our Tiger Moth's all built-up lightweight construction makes this an ideal summer evening flyer. It was designed by Dale Tattam.

Wingspan: 36" / 915 mm
Power Source: Speed 400 brushed motor or equivalent brushless motor set
Radio Functions: Four

Matching items include:
Laser Cut Wood Pack (WP2675)



Order Code: MW2675 **RRP:** £14.50
Please quote 'Pick Your Own Plan' offer code PYOP400 to receive your PYOP discount of **50%** off the RRP plan price. Tel: +44 (0)1684 588599 Website: www.trapletshop.com



Model Aircraft Builder

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

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

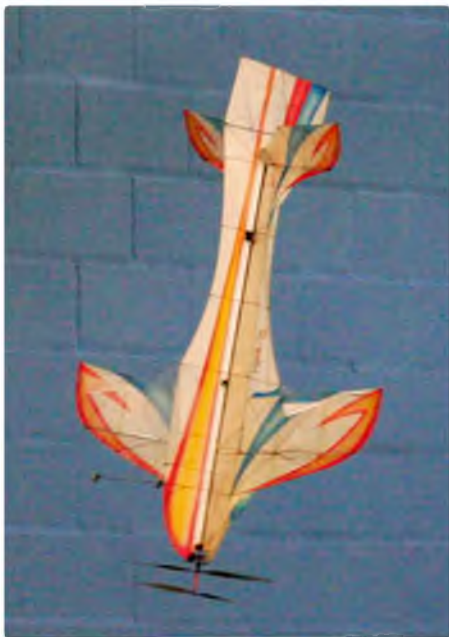
Make sure you give it a 'like' by searching for Model Aircraft Builder or visiting: facebook.com/modelaircraftbuilder

T&C: This offer (PYOP400) ends on 18/5/17 and cannot be used in conjunction with any other offer. Post & packaging charges apply.



Electric Indoor Masters 2017

The dust has settled following another amazing weekend of flying at the Metrodome Arena in Barnsley over the weekend of 14th and 15th January, 2017. Mark Wilcockson reports on all the flying action



Derk Van der Vetch's Victory F3P

The EIM has firmly established itself as one of the premier aerobatic events in the country. This year new faces and old battled it out over the two-day event, which has always tried to combine a mixture of fun with serious competition.

The 'Masters' features seven classes of competition, which always ensures that the event produces an action packed weekend, featuring some of the best flying to be seen anywhere. The events are:

- F3P 'C' schedule
- F3P 'B' schedule
- F3P 'A' schedule
- Aeromusical
- Freestyle
- Team Freestyle
- Pylon Racing

F3P Schedules – This represents the traditional style of aerobatics where pilots fly a sequence of the same known manoeuvres



Steve Schafer's Victory

in front of a panel of judges. The emphasis here is on the precision of each manoeuvre. The increasing level of complexity in each of the classes ensures that whilst the 'C' schedule could be accomplished by the average indoor flyer, in the International class 'A' schedule there is more than enough to challenge even the most skilled of indoor pilots.

Aeromusical – Pilots are free to fly a choreographed routine to music of their own choice.

Freestyle – Pilots have to fly to music, as in 'Aeromusical', however the big difference is that the audio track is selected at random by the pilot just before he makes his flight.

Team Freestyle – Team freestyle, like individual freestyle, is all about crowd entertainment and fun. It is not necessary to perform well-choreographed flights,

although pilots should attempt to reflect other members' activities.

Pylon Racing – Always a huge favourite with spectators and pilots alike, which sees a mass start, then racing around two pylons. The challenge is to fly fast and survive to the end!

Saturday's Events

Events started early on Saturday morning with the first rounds of the 'B' schedule being contested by four pilots. Leicester based teenager Luke Oliver pitted his skills against Dave Bedford from Luton and two local pilots from Sheffield, John Day and Paul Ellis. It was clear from the first flights that young Luke Oliver was in impressive form, scoring high with the judges for his straight lines, constant speed and the smooth curves throughout his figures.

The atmosphere in the hall started to become noticeably more tense as the 10 pilots in the top class 'A' schedule commenced their first round flights. The standard of flying on display was just simply minding blowing, with the 11 compulsory figures that make up the 'AP' schedule being flown with superb accuracy and a gracefulness that is mesmerising to watch.

Once again Dutch pilot and F3P legend, Derk van der Vecht was setting the standards. He was flying a full carbon 'Victory' model, equipped with a super lightweight 'Lanstov' contra-rotating motor that was spinning 12" props and powered by a tiny 1S 120 mAh LiPo.

Top UK F3P pilot, Connor Stephenson flew his brightly coloured 'Heatwave' with a Russian made Lantsov contra-rotating motor. Although his model was considerably heavier and faster than all the other models in the class, Connor demonstrated that the ability of the pilot on the sticks counts more than having the latest and lightest model available.

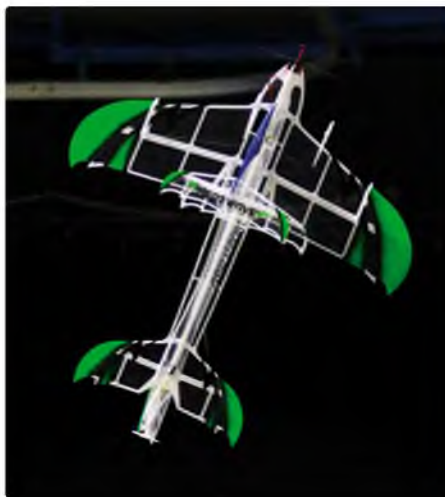
Connor was part of the British team who competed in February at the World Championships in Strasbourg, along with teammates Steve Schafer and Liam Clayton.



Indoor aerobatic models at the EIM such as this Elanor 2015 were flown with superb accuracy and a gracefulness that was mesmerising to watch



Here comes the Red Baron!



Connor Stephenson competed with his Heatwave



Derk Van der Vetch looks pensive pre flight



More Elanor 2015 action shots



Adam Lomax arrived at this year's event with his own designed Depron and Mylar airframe, powered by an amazing home built contra-rotating motor. The gears for this motor, he assured me, were sourced from a local 'Poundland' store and he estimates the whole model only cost him £35 to build.

The opening rounds of the entry level 'C' schedule were held next, this year being contested by four pilots. They were 'EIM' débutantes, Steve Dunne and Alan Clayton, together with the oldest competitor in the competition, GBRCAA stalwart Ashley Hoyland, and the youngest pilot, Rory Tooley. Rory dominated the field from the start, showing that he has not only mad 'stick banging' skills but he can fly precision sequences equally as well.

Freestyle was flown in between the 'schedules'. Two contestants flew against each other in a two minute head to head, to a backdrop of randomly selected music chosen by the pilot immediately prior to the flight from a pre-determined list of tracks. The winner of the 'head to head' battle was selected by the viewing public who had been issued with red and blue coloured cards, which they held up at the end of the two flights to vote which pilot had impressed them the most and he was awarded the points for the round.

Derk van der Vecht faced Steve Shafer in the first round, narrowly beating the UK ace 17 to 13 after the scorecards were counted.

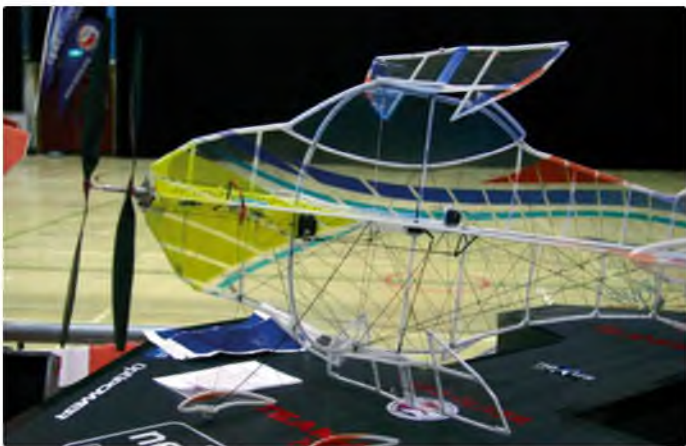
Paul Wilcockson flew an unusual model in the second heat against Connor Stephenson; his Twisted Hobbies 'Crack Fokker' triplane

looked resplendent in the 'Red Baron' colour scheme of Manfred von Richthofen. The model had great presence in the air and was surprisingly aerobatic, but the 'Red Baron' didn't have enough to beat Connor, who flew a slick and polished flight.

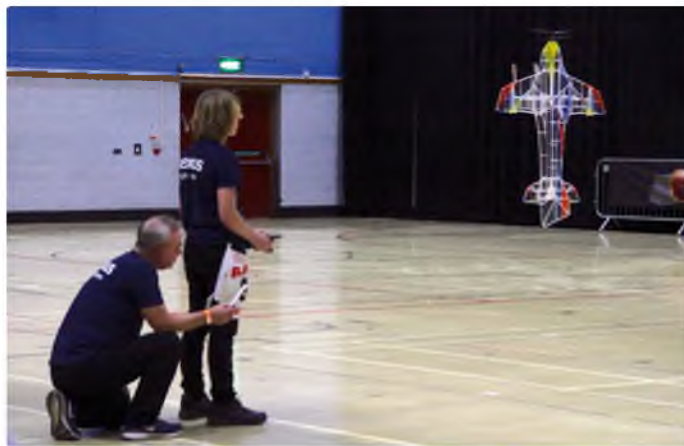
Matt Hoyland had a tough task in his first 'Freestyle' round, being drawn against Rory Tooley. The speed of the youngster's fingers was evident from the time the aircraft left the floor, with his EPP Super-lite Edge V3 snapping and rolling its way around the arena to the beat of the background music. Rory clearly loves his flying and you have to wonder how these youngsters get so good so quickly? Well, in the case of Rory it's practice, especially on his simulator. On an average week he will spend four hours every night working on his flying skills!

Derk Van der Vecht wowed the crowds with his amazing six-minute demonstration Aeromusical routine in the lunch interval, flown to the Jon Miles classic 'Music Was My First Love'. This is always a breathtaking routine to watch and it encompasses everything good about flying to music. The applause from the crowd was probably the loudest heard all weekend.

Early afternoon saw the first round of the eagerly awaited Aeromusical contest. This particular discipline has always proved to be a massive favourite with the spectators and pilots alike. The stand out flight from the first round came from Connor Stephenson, who put in a really polished display to a 'James Bond Theme' sound track. This saw him on top of the leader board and above Derk



Dynamic braking of the Elanor



Luke Oliver in the prop hang



Adam Lomax designs his own planes!



Paul Wilcockson gives scale to the Crack Fokker



Luke Oliver and Rory Tooley on their hover-boards. As if flying at this level is not hard enough!

van der Vecht, with the raw scores reading 159.33 for Connor and 158.00 for Derk.

Sunday's Events

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

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

Derk van der Vecht continued to dominate, showing no signs of nerves or pressure. He

flew two nearly perfect schedules with his 'Victory'.

Connor Stephenson was the pick of the British pilots, holding onto second place with two impressive 'AF' schedules. Contest Director, Matt Hoyland was not far behind flying two tidy schedules with his Gernot Bruckmann 'Trivia'.

At the end of the competition Derk van der Vecht was again the top pilot in the expert 'F3P A' class, followed by Connor Stephenson in second place, again just edging Steve Schafer, who took third place on the podium.

Victory in the 'B' schedule was taken

comfortably by Luke Oliver, who took every round from the local pilots, Paul Ellis, who took second, and John Day, who finished a creditable third.

Rory Tooley, secured a well deserved victory in the entry level 'C' Schedule, again taking all six rounds. Alan Clayton flew well all weekend to take second place, with Ashley Hoyland in third.

Aeromusical

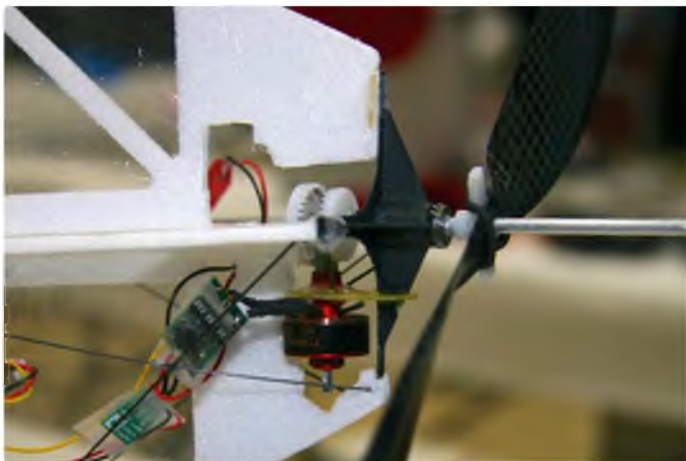
Sunday afternoon saw the second round of Aeromusical. Derk van der Vecht showed his pedigree, delivering a flight that was more polished than his previous ones. Connor Stephenson flew another fantastic routine with his 'Vapour' to his James Bond themed music. Connor blended speed and aggression with sections of smooth graceful flight, all well choreographed to his chosen music.

Derk van der Vecht took the round 162.00 to 156.67 on the raw scores and once normalised the overall victory went to Derk.

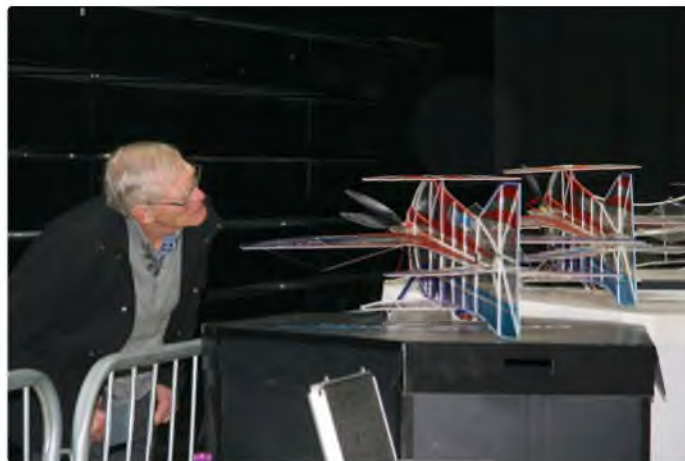
Freestyle

The Freestyle semi-finals kept the entertainment factor high for all those watching. The first semi-final saw Derk Van der Vecht fly off against Luke Oliver. Luke flew a fantastic routine with his own design 'Edge', equipped with a variable pitch propeller (VPP). It was not quite enough to beat the Dutch ace though, who progressed to the final.

The second semi-final saw Rory Tooley against Liam Clayton. Rory flew his 'Twisted



Adam Lomax's home-made contra prop system



Spectators were able to get close to the models to see all the details



The pit area was busy all weekend



A model makes a wall landing!



Matt Hoyland gets ready to fly



Team Duo DB line up with their Disneys

Hobbies' Super-lite Extra V3 to great effect. Liam's flight looked equally impressive, with good synchronisation to the background music, but it was Rory who went through to the final.

In the final Rory Tooley pulled out all his tricks in a valiant attempt to beat the Dutch favourite, Derk. To the amazement of the crowd he came out onto the arena floor for his flight balanced on a hover-board! The crowd gave him a large applause as he propelled himself across to the flight area, following his model while performing rolling harriers.

Derk did not disappoint but he needed to use all his insane flying skills to gain him a well deserved victory against the impressive youngster. His flight to 'Uptown Funk' was simply breathtaking!

Team Freestyle

The Team Freestyle event was contested this year by four team teams. 'Team Duo-DB' consisted of Dutch experts Derk and Bert Van der Vetch, who took a well deserved victory.

The pair performed a routine with their slow flying 'Disney' models in almost perfect synchronisation with each other and utilising every spare inch of flying space in the hall. It was just utterly brilliant to watch – when you have a spare five minutes check it out on YouTube!

Second place was taken by 'The Boys', consisting of Rory Tooley and Luke Oliver, both flying a pair of matching Twisted Hobbies Super-lite Extras. In third place were 'Team Rolls and Royce', consisting of Matt Hoyland and Adam Lomax.

Pylon Racing

Competitors battled it out in an action packed event that is a firm crowd favourite. All pilots flew a round in each direction, before the final round over a more demanding figure of eight course, which is designed to increase the risk of carnage. The pilot who completes the most number of laps in two minutes over all three rounds is crowned champion

Derk van der Vecht was leading the pack in the early rounds until he was clipped in a mid-air collision, bringing down his model and leaving the coast clear for Paul Wilcockson to claim overall victory with his 'Crack Yak Mini'.

Prize Giving

The prize giving concluded another fantastic weekend at the 'BMFA Electric Indoor Masters', during which the 'Katie Anne Whitehead' Pilots Choice Trophy was awarded to Matt Hoyland in recognition of all his hard work.

An extra special thank you must go out to all the people that made this event possible. The BMFA, the GBR/CAA and all the kind sponsors that gave so generously.

Overall it was another amazing 'Electric Indoor Masters'. The standard of flying was simply breathtaking; the quality of those competing gets higher each year, especially from our own home-grown pilots, who are making great improvements to enable them to compete on level terms with their European counterparts.

What is clear is that the 'BMFA Electric Indoor Masters' is fantastic fun. If you never been, you are missing an absolute treat. 2018's event should be back at the Barnsley Metrodome Arena so watch out for the dates being announced. **RCMW**



A superb set of raffle prizes were donated by the sponsors



Freestyle podium: 1st Derk Van der Vecht, 2nd Rory Tooley, 3rd Luke Oliver



Team Freestyle podium: 1st Duo DB, 2nd The Boys, 3rd Team Rolls and Royce



Pylon Podium: 1st Paul Wilcockson, 2nd John Gaynor, 3rd Adam Lomax



F3P A: 1st Derk van der Vecht, 2nd Connor Stephenson, 3rd Steve Schafer



F3P B: 1st Luke Oliver, 2nd Paul Ellis, 3rd John Day



F3P C: 1st Rory Tooley, 2nd Alan Clayton, 3rd Ashley Hoyland



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Jeti DC-24 Carbon Line Multimode



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REX12 12Ch Rx w/ Telemetry - £102.50

DC-24 Transmitters from £1,319.95

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E&OE



Cri-Cri Complete!

John Higgins provides a quick update on his magnificent twin electric Cri-Cri, which we serialised over the past three issues

Followers of the Cri-Cri saga will know that, after three years in the making, the model had successfully flown and was almost complete, save for the cockpit interior and a few scale details such as the front wheel spat and the scale spinners. Had I spent time on these items before the model was taken out to fly I would have missed the test-flying window at the end of the 2016 flying season. My plan was to have all the 'fiddly bits' as my 2016/17 winter building project – just as well as I've run out of storage space for any more models! As the nights lengthened and the weather closed in, I added cosmetic interior structure to the

cockpit interior and fabricated a false floor (more of this later) to cover the receiver and servos that had their home at the bottom of the fuselage.

The Cri-Cri still needed a pilot figure and, at 47% scale, he would be a major feature under that goldfish bowl of a canopy. I'd toyed with the idea of carving a figure from foam and dressing him from the supermarket children's section, but the more my wife and I looked, the bigger the problem seemed to be; small children don't have the same proportions as adults. The effect would be far from satisfactory. We could, of course, make some clothes for him ourselves, but I did not

know where to start with such a task, and my wife did extra Latin at school instead of needlework!

Similarly, producing life-like heads and hands, at this scale, was beyond my limited artistic abilities. I considered having a head 3D printed, but this was only a partial solution as I would still be without hands, body and clothes so this route was rejected. A commercially produced pilot it would have to be.

Tailored Pilot

Step forward YT International with their range of Tailored Pilots. These full-bodied



A 44% scale Tailored Pilot is almost the right size – after a bit of surgery!



The instruments are properly spaced, with the glazing and instrument pointers made as separate items. The bezels were made from bits of plastic tube



At nearly half scale an early test flight picture shows the need for a pilot figure under the Cri-Cri's huge bubble canopy

pilots are available in a range of scales, but my model falls between these scales; 1/3 scale is much too small and the 1/2 scale chap is too big, and too wide across the shoulders, to fit into the cockpit. Luckily, a pilot was available at 1:2.25 scale, which translates at 44% scale – just a little smaller than my 47% scale model. His shoulder width was spot on but as a result of the model having a false floor to the cockpit he was too high when in the sitting position – it never rains but it pours!

All was not lost, however, as the pilot could be modified to give him the requisite 330 mm sitting height. You really had to feel for

the poor bloke as he had to undergo a bit of surgery, which involved the removal of his buttocks and a slice of foam from his middle! YT promised to work the magic (thanks, Wilson) and quoted a four week delivery time. True to their word he was completed in exactly four weeks: I took delivery on the Thursday before Christmas, at 8.30 in the evening!

Instrument Panel

Whilst waiting for my pilot, I made a start on the instrument panel. Now, an instrument panel made from a piece of printed paper might well prove convincing enough if

buried in the depths of a small-scale model but at nearly half full size and in full view... Something better was called for. Luckily, when it comes to making instrument panels, I was not (for once) at the bottom of the learning curve, having previously made realistic panels. I was really quite pleased with the end result. The instruments had proper spacing between the dials and the glazing and the instrument pointers were all made as separate items. The instrument bezels were made from bits of plastic tube, sourced from that well-known provider of scratch builder's requisites, B&Q. The panel took over a week to make, but, hey, it was raining and blowing a gale outside and my workshop was warm and dry.

Now that I had my pilot I got on with providing him with a seat, making a belt to keep his trousers up, giving him a joystick to hold and fitting him with his seat harness. The webbing was from a well-known chain of haberdashers and the fittings were hand-made from thin alloy sheet. One can, of course, buy these sort of things but where's the fun in that? A few more bits and bobs, a lick of paint and the cockpit was done. I can never aspire to the standards of perfection achieved by the true Gods of Scale but I must confess to being pleased with my humble efforts.

Other Items

The nose-wheel spat was a piece of cake – I discovered that I had a suitable fibreglass item in stock of the correct size and shape, that, with a bit of adjusting, strengthening and general fettling, would prove to be ideal. I finished this up to the painting stage; it would be sprayed, together with the yet-to-be-moulded spinners, when warmer weather arrived, prior to the flying season. The spinners proved easy, if time-consuming, to make using ply back plates and the 'lost foam' method. The carbon/glass shells seemed, when complete, to weigh almost nothing, too.

The completion of a long-term project always arouses mixed feelings, with great satisfaction and a sense of achievement being tempered by the fact that the project has, at last, come to an end; a similar feeling to just having finished reading a really good book. With modelling, however, a project never really comes to an end when the building is complete. There are all the many hours of flying to look forward to... **RCMW**



'Hugues' needed a belt to keep his trousers up, a joystick to hold and a seat harness made using haberdashers webbing. The fittings were made from thin alloy sheet



The spinners were easy to make using ply back plates and the 'lost foam' method. The carbon/glass shells weigh next to nothing

High Tension



In his latest article about petrol engines Ivan V discusses what material makes the best cylinder liners

Many modern model petrol engines use traditional processes and materials and they certainly don't lack performance in any way

is not a good bearing for brass and this applies to so many other metals and alloys, but cast iron on cast iron is excellent in most applications. The engine block of a car engine is cast iron and the piston rings are cast iron, a combination that has been used many millions of times and, in some applications of very high quality, the lasting qualities are legendary.

Probably the most important years for development of engines was the Second World War, when superiority in the air was of extreme importance. How many millions of pounds and dollars went into research, testing, fabrication and manufacture would be impossible to calculate.

For the time, engines for cars were right up to the mark and some of the high end vehicles had magnificent and enormous engines that produced incredible power. They also had another attribute, which might have been good for keeping them on the road at high speed, but it was not an attribute as far as aircraft engines were concerned (it was a disadvantage) and that was the weight.

The power to weight ratio was the killer for many engines due to the use of cast iron. Engines were built with fabricated steel cylinders but with limited success and the aircraft engine manufacturers were in a frenzy trying to come up with an answer.

And then came aluminium alloy, the answer they were seeking.

Aluminium and its alloys are not suitable for high wear situations such as the liner of an engine, but the outer section of the case was an ideal candidate, as were the pistons. But good old cast iron was still in great demand for its superior wear qualities, so slip in liners and piston rings were produced in cast iron and these went into the aluminium alloy engine cases.

While there have been other materials used for liners in latter years, it is still hard to beat cast iron for its ease of application, easy machining and stable characteristics when subjected to heat and combustion forces. And it retains these characteristics even when used in very thin profile sections. There are several very high end model petrol engines that have cast iron liners and rings, and, believe me, they certainly don't lack performance in any way.

Over the many years I have been asked the question, 'What material makes the best cylinder liners?', I have discussed the pros and cons of different type of liners and listened to arguments, discussions and opinions as to what constitutes the best cylinder liner.

Over many years of internal combustion engine construction many metals have been utilised for the production of liners and there are many myths surrounding the use of some metals, and the metals used for the pistons and/or rings, and here you can certainly start up a lively discussion with some 'petrol heads'. But the sad truth is almost all the arguments put forward have absolutely no basis.

Looking at early or, possibly the very first liners, the metal we encounter is cast iron. Iron is a basic material known to humans since the 5th Century BC as an invention by the Chinese, who found it very amenable to casting – heating it to a molten stage and then pouring it into moulds or casting pans.

Apart from the casting aspect perhaps its greatest attribute is its wearing qualities and this is partly due to the fact that it is porous on the surface, providing a great ability to slide, as well as retaining oil, coupled with its own self lubricating quality. The superior grey cast iron has graphite in its make-up and this

is a well known natural lubricant.

Think back to the time of the first internal combustion engines; what other metal could be used? Engine blocks were (are) cast in iron, pistons were iron or, in some cases, an early form of iron alloy that became steel with the addition of various ingredients. That it has stood the test of time is evident in the fact that for many internal combustion engines today there is no greater material than cast iron.

One other excellent quality, and one that defies one engineering principle, is that it can be used with absolute success for moving contact with itself. As a very general rule like metals should not be used together for moving applications. For example, brass



Centrifugally cast iron (Meehanite) is ideal for piston rings, pistons and liners. Note the spiral marks indicating the rotation while being formed

Let's Try Steel

As I showed you last time a cast iron cylinder/barrel is quite substantial, heavy and the fins, if finely machined, are quite brittle. Early model petrol engine manufacturers, in order to reduce engine weight and reduce the risk of breakage, had a period of steel liners and steel barrels and liners in one piece. The wall thickness was kept to a minimum, as were the fins, but another problem cropped up – how to include bypass channels and, also, prevent the fins from being bent when bumped (i.e. bashed, crashed or dropped!)

There was little success as far as the fins, which, really, was the owner's problem... Just don't handle the engine roughly!

The bypass channels (a.k.a. passageways) were necessary, as it is by these channels that fuel travels from the crankcase to the combustion chamber. A cast iron liner doesn't have these problems as the channels can be cut into the thick wall, but weight saving was the game of the day.

Okay, here's a simple solution – braze (generally silver brazing, a.k.a. silver soldering) the channels on the outside of the

liner/cylinder wall. Now, while this is a neat and good solution for the home builder, even today, it would not be viable as a commercial project unless we went back to those early times. Wages were not prohibitive for employers, there was plenty of work for workers and time was not so precious as it is considered today.

For sure, there was no place for a slack worker but the work ethic was different and, generally, the worker knew well his/her responsibility as far as producing items in a time frame that would allow the employer to make a reasonable profit, as well as make enough to pay their wages, and that was the big stimulus.

Do It Yourself

While I cannot tell you exactly how the cylinders were made (using different processes and practices), I can give you an idea of the basic process as I tried it out myself, out of interest, quite a fair while back. Simply, take a length of very thick wall steel tubing or a steel bar, machine the outside down to the required diameter, leaving a flange on one end and a specified section

on the other end. The specified section has fins machined into it, leaving a few shallower fins at the top for the purpose of drilling and tapping holes for the head retaining screws. The inside is machined to a fine finish, but not a total finish, then the apertures for the transfer ports and the exhaust port are cut in using milling cutters or broaches.

A steel section is formed, or a piece of steel tubing is slit in half and blanked off one end. Mounting holes are drilled in the base flange, plus a hole for the transfer port. The section of tube is placed on the side of the cylinder mating to the hole in the flange and the transfer hole higher up.

It is my consideration that the job would be set in a reasonably solid jig or bed, maybe made from brass for example, or even steel, to draw the heat during the brazing process as the bypass is brazed to the cylinder. This would help to prevent distortion and the need to cut a lot of metal from the inside for accuracy.

Finishing off, it had a very fine internal skim and then a hone for the final surface. The result was a fabricated cylinder/liner that was simply produced and very effective for its purpose.



Above: This is a combination of a cast iron liner with integral barrel fins. Can you see a problem here?

Left: Yes, though it has many desirable features its downfall is its brittleness. A 'dirty landing' can break bits off very easily

Connecting Rods

In the process of working out methods of machining and fabrication, to keep costs down and to alleviate the need for extra machines and complicated processes, the connecting rod would have also come under the spotlight. Whichever method is used for producing batches of connecting rods it is going to be complex and expensive.

If they are going to be forged they will be subjected to a lot of development before final machining. To be fully machined requires many processes and very accurate jigs

(I will delve into the connecting rod types in a later article) so your choices are quite limited. Unless – and here's the bright idea moment – they are fabricated using a similar process as we used with the cylinder. And, even though this is a bit of history, we have a very similar process used right up to this day in some engines.

Okay, fabrication – what do we need? A relatively simple jig that has two dowel pins at accurate centres for the big and little ends (eyes) and a couple of locating strips, or even pins for the shank. Short lengths of

steel or bronze tubing of the required bore diameters are cut and de-burred, then strips of a reasonably tough low carbon steel are cut to length and with a tapered overall section.

Each end is either pre-drilled or punched so it has a crescent shaped end to fit on the short pieces of tubing. Place a big and little end piece of tube on the dowels, lay the shank section in place and silver braze the pieces together. The result? One connecting rod.

The use of a simple steel for the eyes is not a problem as they would be in an annealed state (probably normal soft steel) but the crankpin on the crankshaft and the gudgeon pin in the piston would be very hard, and this is a good bearing match, soft on hard, even though the metals are the same. The loads and wear on a connecting rod are often misunderstood by a lot of engine fanciers so we will look at this as well when I get to dealing with this part of an engine.



Here it is – the connecting rod to end all 'rod' designs! These were very easily fabricated conrods; the two eyes (big and little ends) were silver brazed onto a steel shank. There is still a lot of merit in this design and we will look into it further down the line

HIGH TENSION

While we are in this area, I am sure some readers will be wondering about the integrity of these early engines? It pays to remember that they were petrol engines and a petrol engine requires a much lower compression ratio than the later glow plug methanol engines. Cylinder pressures were not extremely high. As well, considering the simple porting and the fact that the 'race' for power and high rpm hadn't dawned at that time, these engines were quite docile when it came to running. Large wooden propellers were used and the rpm figures were more in keeping with those of a full size aircraft engine, where 3,000 rpm was/is considered a very high revving engine.

Going back now a few years, O.S. produced a limited run of reproductions of the very first commercial engine produced by

Mr Ogawa, the founder of the O.S. company. The engine was, obviously, petrol fuelled and it was the O.S. Type 1 Pixie with a capacity of 1.66 cc, of which only 200 were originally produced.

I was contacted by a modeller who had purchased one of the reproductions and had run it, but was disappointed to find that the maximum rpm he could obtain from the engine was bordering on 6,000 with the smallest propeller. I told him he was extremely fortunate as the original engines would have been lucky to run at that speed. With the modern machinery practices used to produce the repro's and modern petrol (in 1936 petrol was nowhere near as good as it is now) the engine was running extremely well for what it was.



Right: An oldie but a goody! O.S. really got it right with their steel liners from the very early days. This engine has a cast iron piston and, like all of its type, is noted for its long life

Advance Of The Steel Liner

Steel certainly had the potential for liners and there was considerable development in the process of production. Probably the factor that provided the greatest impetus was the rapidly developing aluminium industry. Here was an inexpensive metal that could be easily machined, was easy to cast and which was stable when cast or formed into desired shapes and sections. It melts at a low temperature (660°C) and it does not require blast furnaces and the like for the melting process. A sample is easily melted in a laboratory and this provided for alloying experiments, with other metals and elements added to provide characteristics required in the final product.

One of the successes of the Rolls Royce engines was (is) the highly specialised aluminium alloys used for many parts and model engine manufacturers followed in style. O.S. and Enya, for example, developed steel liners for their engines that have legendary status – you can't wear them out.

These modern liners are not greatly different to those used for the first model engine liners except for the carbon content and the incredible hardening process used. While the liners are identical in basic

concept the bypass ports are simply cut into the liners, with the passages and the head retaining screw threaded holes being incorporated into the cast aluminium outer casing.



A good example of a cast iron liner in a modern day engine. Note the thick rim for strength in this section



Putting it all together, this is the steel liner, rotary valve, driven gear and crankshaft, all in one piece. There's a lot of machining in this and it is all as hard as diamond (well almost!) This is the heart of an RCV Compact Design 20 cc engine



An all steel liner of a common design. Many machining processes are required to get it to this state, then it has to be heat treated and finish ground to precise dimensions

More Liners

As the popularity of engines for models (aircraft, boats and cars) increased the race to produce better, more powerful and less expensive engines was an ever increasing goal. There is only so much you can do with the porting and timing to increase power before the engines lose out on performance. By performance, I mean all the attributes – rpm, idle, starting, flexibility, longevity and, most important to many, reliability.

One area where performance can be improved and, if desired, rpm increased is the reduction of drag – the friction of the moving parts – as friction and drag can rob an engine of a large percentage of its power, power that could be better utilised in the final output.

One of the changes made by some manufacturers of high rpm engines was the use of a Dykes ring. A normal or standard ring is fitted rather tightly in the bore of the liner and a very small gap is left to allow for expansion; the gap is arrived at by a calculation derived from the bore.



A common style, everyday, fully machined (bar stock) piston. Note the position of the ring groove



The groove is a wide slot to totally enclose the ring. The crown (absolute top) section above the groove is very slightly reduced in diameter for several reasons, which we will investigate in a future article

This type of ring has a spring effect in that it wants to expand outwards and it has a very close fit on the upstroke of the piston, giving a certain amount of friction drag. When the engine fires under combustion the ring expands to its absolute maximum as it is pushed down by the force of the combustion explosion. The expansion continues at maximum until the crown (top) of the piston reaches the exhaust port and the power gas is expelled. There's not so much pressure on the ring now but it is still a tight fit.

Some engines have a very slight taper in the bore, being larger at the bottom, to alleviate this drag but it is still a question of doubt how effective this is and what effect it might have on the ring as it opens out slightly, then closes tightly thousands of times per minute.

The Dykes ring is different in that it is not a tempered ring, i.e. with no strong outward spring action and it is L shaped in section. It sits almost at the top of the piston, with the base leg of the L in the ring groove and it is a rather loose fit. When you turn the engine over (rotate the crankshaft as it does when running) there is no compression. It feels like the engine is absolutely worn out and this is the reason for its use.

When the piston is rising there is almost no drag friction and on the way down, when it passes the exhaust port, there is no drag friction again. The only period when the ring is a tight fit in the liner is after combustion, when the combustion gas blows down the inside of the L and forces it out against the liner wall.

Moving Off

More liner configurations next time and the beginning of the ABC combination. **RCMW**



Now we have a piston from an engine that employs a Dykes ring and there are several differences to consider



First is the ring groove, right at the top of the piston. Then the thin crown section is considerably smaller in diameter to allow the combustion gas to expand the ring from the inside



A standard design cast iron ring used on almost all ringed engines. The section is generally rectangular (there is a formula for the sizing) but they are occasionally square in section. The ring is expanded and heat treated to give it the 'spring out' effect



Also cast iron, the Dykes ring has a L shaped section and it a rather loose fit on the piston. It is commonly left 'green', i.e. not heat treated, but that depends on the manufacturer

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Scale Soaring

Chris Williams reports from the last Ghost Squadron Aerotow of 2016 and catches up with a pair of scale gliders, namely a Schweizer TG3 and a Wassmer Super Javelot



Graham Foster's new 3.5 scale Skylark 4 takes to the air at Middle Wallop



Noel Rumers with his impressive scratch-built third scale electric SF 27



The SF 27 in action

Ghost Squadron Aerotow, Middle Wallop, 15th-16th October, 2016

It has become traditional in recent years that the Ghost Squadron's do at Middle Wallop marks the last of the major events of the season. An enigmatic forecast seemed to favour the first day of this two day event so Smallpiece, Motley and myself duly rolled up on the Saturday, determined to make the most of what was on offer.

Some time ago Smallpiece had started to build a Skylark 4 from one of my old Traplet plans (MW3105 & MW3106). He is one of those people who like to tinker and will never leave a plan unchanged if he can possibly complicate it a bit more. (This is directly opposite to myself, who tries his very best to make things as simple as possible.) In the fullness of time his reservoir of enthusiasm ran dry and the unfinished airframe was passed on to someone else. I presumed it would be lost to history.

Amongst the many gliders parked up on the day I noticed a very pretty Skylark 4, painted in an attractive red livery, with a white stripe along the fuselage. This had been brought along by one Graham Foster and, blow me, it turned out to be the very airframe that Smallpiece had started, way back during the reign of Mad King George. This model, too, went on to make many flights during the day after the initial successful maiden flight and for many days afterwards I had to fight the urge to start the construction of another one!

There was much to see and admire, none more so that the Scheibe SF27 of Noel Rumers, who had travelled all the way from his native Belgium. Over the course of the winter we had watched with admiration as the build had progressed on the SSUK forum. As time went on we saw more and more exquisite bits of engineering going into



Distinctive ailerons on Terry Holland's 1/4 scale Goppingen Wolf

the airframe, such as the scratch built up-and-go system, and the working trim tab on the elevator. The metal tube structure of the full size had been simulated in wood but the GRP front end that slid onto the frame work was as per the full size.

I offered up the opinion that with all that clever engineering inserted, it would be too heavy to take-off, but Noel was not deterred. In the event, the model performed very impressively at Middle Wallop, going on to make many flights during the day, and we did not skimp when it came to offering up our compliments.

Once in a blue moon, or even less often, we get to see a twin tow: that is to say, two gliders towed up simultaneously behind one tug. This is an occasional full size practice, too; the idea is to have one line slightly shorter than the other to give longitudinal separation and for the glider pilots to keep as far apart as possible during the tow.

In relatively recent times Peter Balcombe built a 1/4 scale Olympia 2b from the Cliff Charlesworth plan, finished in the livery of a recently restored full size version, here in the UK. Last year, no doubt using some unspecified blackmail method or other, Cliff Evans persuaded him to build another one, finished in the self-same colour scheme.

So, here they were, both models present at the same event, and the idea was born to attempt a double tow with the pair of them. Becoming aware of this cunning plan at the last moment, I had to get a fair shift on to get the camera switched on and get into position for a decent shot, once I saw them lined up on the runway. Instead of the excitement I was expecting, in the event the whole thing was a bit of an anticlimax, with both models gaining a respectable height before releasing.



Seeing double! Twin Olympia 2b's get a simultaneous tow



Motley (Geoff Crew) with his new 1:3.5 scale Schweizer TG3



Author with the new 1:3.25 scale Wassmer Super Javelot



The Javelot in action at White Sheet

Some time ago Smallpiece and I were flying two Minimoas at our home flat field club and despite the models having totally different colour schemes, I still managed to start flying the wrong one, shouting 'radio failure' at the top of my voice. Hats off to Peter and Cliff, then, for pulling the thing off.

Each and every year Terry Holland brings along the results of his winter workshop sequestration to one or other of the Middle Wallop events. He left it to the last one this year but, true to form, this time he had brought along a very nice version of the Goppingen Wolf. Just before the war, in the mid thirties, the Wolf was produced to compete with the then very successful Grunau Baby. Its most noticeable feature



The TG3 in action with on-board cam

are the large, lobate ailerons, which give it a very distinctive appearance. (It's worthy of note that the full size prototype was sold to a buyer in the UK and subsequently toured with Alan Cobham's Flying Circus.)

Not being a flyer himself, Terry entrusted the maiden flight to event Main Man, John Greenfield and the model was duly pronounced fit for purpose. That was the Saturday but with the forecast for the following day leaving a lot to be desired, with showers and strong winds, and with matters piling up in the workshop, I decided to leave it to more hardy souls. (As it turned out the forecast was more downbeat than it needed to be and a fair amount of flying took place.)

Thus, 2016 came to an end and it leaves

me only to congratulate the Ghost Squadron for once again putting on a full season's worth of events, and to thank the tug pilots for all their sterling efforts over the year. Here's to next time...

Schweizer TG3 1:3.5 Scale

It was at a recent Middle Wallop event that Motley clapped eyes on the 1/4 scale TG3, originally built by Colin Cousins but now under new ownership. It is said that beauty is in the eye of the beholder and in this case he fell head over heels with a thud. Finding a plan proved somewhat problematic but eventually he found a plan from the AMA at one-fifth scale and we set about the scaling up process with a will.



Motley gives the Javelot its maiden launch



Using a cone cutter to retro-fit the Smallpiece release



Barry Cole's sideways release solution

The wing ribs were plotted in Compufoil and I drew a basic wing plan in Illustrator and sent him away to do the business. Just before Christmas we got to maiden the new machine at the County Model Flying club, with Smallpiece doing the tugging honours. (Smallpiece had his new Greenly tug, fitted with a swanky self-starter. Heads don't 'arf turn when it bursts into life all by itself!)

The TG3 proved an excellent performer and the next time around Smallpiece had also sorted the extensive decal set that finished the model off. What a handy pal that Smallpiece is!

Back In The Workshop

On a personal front, I had been beavering away at my latest project, the Wassmer Super Javelot, built to the same 1:3.25 scale as my Slingsby Kite 2a. What initially attracted my attention was the wing dihedral arrangement, which, looking a little like the free flight gliders I had built as a lad, would serve to make something that looked just a little bit different.

Once again bets have been hedged with the fitting of an E-assist motor and the front

bearing and shaft are set back in the nose enough to allow the fitting of a blanking plate, so that when the propeller is removed the model returns once again to a pure glider condition. The maiden flight went well, with the Javelot proving to be a smooth performer with no vices

I'll leave it there, as this will be an RCMW plan feature in near future, and then plenty more detail will be available...

Releasing Sideways

As events have recently proved, electric assist greatly increases the range of operating conditions in which a model can fly, but until recently aerotow was not easy to achieve due to the difficulty of fitting a tow release with all that electricravery up in the nose. Clever lad that he is, Smallpiece (Barry Cole) came up with an ingenious idea for a release that could be fitted flush with the side of the fuselage, rather than being fitted in the nose.

This is a simple short length of 20 mm ali rod, scooped out (scooped out being engineering tech-speak for doing the job in a lathe!) and drilled appropriately to allow a

steel rod to move in and out of the aperture in the traditional manner. Retro-fitting proved quite simple with the use of a stepped cone cutter and the servo can be mounted against the inside of the fuselage. Having fitted one to the Super Javelot, I felt obliged to fit the second one to the Zugvogel, as the pics will attest.

It's not really my intention to accept a launch from a tug pilot and then leave him twiddling his thumbs whilst I use up my batteries, but rather to increase the utility of these two E-assist models to cover every possible flying opportunity.

Reasons To Be Cheerful

Due to the plummeting value of the Pound, the Kilogram is now worth 15% more. This means that a 22 lb model now weighs 25 lb plus. They never told us Brexit meant a higher wing loading! **RCMW**

CONTACTS

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The Strength Inside Your Model

John Bristow from Deluxe Materials focuses on some particularly common types of adhesives, notably PVAs and epoxies



Emulsion And Epoxy Polymer Adhesives

In Part 1 we learnt what an adhesive has to do and how a combination of adsorption and chemisorption play an important role in delivering adhesive and cohesive forces that ultimately hold materials together and fill gaps. Now, having considered how glues work, let us have a closer look at how they are built to serve our modelling needs. We include tips on how best to use them.

In Part 2 of this article we are looking at the water based, air drying adhesives commonly used for modelling. The most common of these is polyvinyl acetate, more commonly known as PVA.

The Arrival Of PVA

It was at the beginning of the twentieth century when scientists discovered that certain potentially reactive chemicals, usually with a small molecular size, could be made to undergo chemical reactions, which caused them to combine together and produce very large molecules called polymers, e.g. the gas ethylene can be polymerised to produce polyethylene, the solid plastic which has different properties from those of the individual starting chemical, ethylene.

This process is used to make several types of polymer adhesives.

The earliest types, and still one of the most common known to aeromodellers, are solvent carrier adhesives, e.g. balsa cement, which uses a relatively hard polymer. Here the polymer is dispersed in a solvent and hardens by evaporation of the solvent.

There are also solvent free polymer adhesives, both one and two part, which harden by chemical reaction. Examples of this type are cyanoacrylates and epoxy resin adhesives.

Vinyl acetate was produced in Germany in 1912 and was found to polymerise easily to give a solid plastic material. By the late 1920s emulsion polymerisation was developed, allowing vinyl acetate to be emulsified as droplets in water. This produced the familiar 'white' product, PVA (polyvinyl acetate), which has become commonly known as 'wood adhesive'.

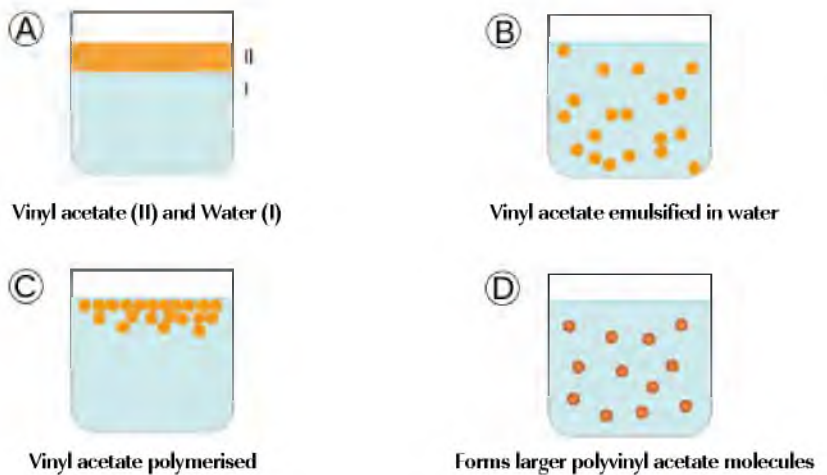


Fig 1 – PVA adhesive is made by emulsifying and then polymerising vinyl acetate in water

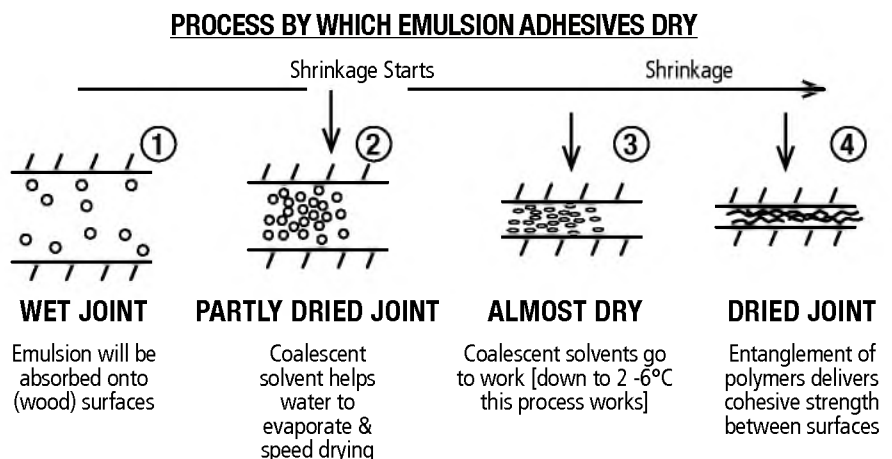


Fig 2 – The process by which PVA adhesive dries



Left: Speedbond PVA uses special solvents that accelerate the drying process

In this case the solvent is water and these so called 'emulsion' glues (dispersions of polymer in water) dry through water loss. Eventually the PVA particles in solution join and, with help from a coalescent solvent, dry to a hard adhesive film. Speedbond PVA glue utilises special solvents that accelerate the drying process.

This hardness, which gives good sanding, makes PVAs unsuitable to join flexible materials such as plastics without some form of modification. Many significant advances have taken place since the early PVA glues:

1. Plasticisers initially used to soften and flexibilise the PVA have now been replaced by naturally softer polymers such as vinyl acetate ethylene (VAE) that are added between 5-40% into the mix. See Fig 3.

2. New advanced polymer adhesives (Aliphatic Resin) have been developed that can be cross-linked (see Fig 3), giving the benefits of greater strength and better joint stability.

Left: Aliphatic Resin is cross-linked to give greater strength and better joint stability



POLYMERISATION TO CREATE HARD & SOFT/FLEXIBLE ADHESIVES

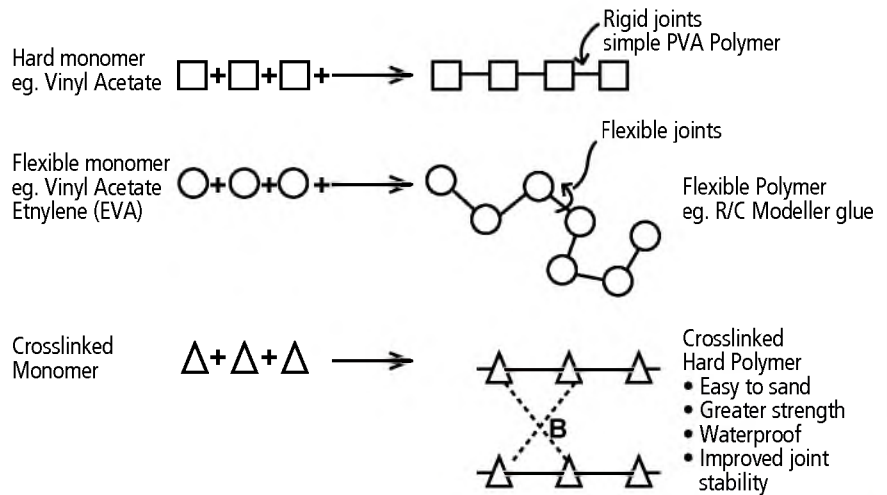


Fig 3 – Design of hard and soft polymers

It is now possible to produce wood adhesives that are suitable for exposure to water.

There are many other types of polymer emulsion widely used as adhesives to give specialist performance. In our R/C Modellers Canopy glue we use a very soft polymer that dries clear but with a trace added solvent that assists adhesion to clear plastic. You might notice a distinctive odour? Well, that's what it is!



Right: R/C Modellers Canopy has a trace added solvent that helps it adhere to clear plastic and which gives it a distinctive odour

Hints And Tips With PVA Type Emulsion Glues

- As the temperature drops PVA type adhesives take longer to dry until they will not dry at all below 7 or 8 degrees C. So keep joints above this temperature.
- Store them out of the sun, sealed in a cool, dark environment.
- Do not allow to freeze.
- Keep dispenser tops sealed when not in use and squeeze the bottle to remove as much air as possible from a part used container.

In summary, emulsion glue technology is making great strides and we, as modellers, can have a wide choice of products with the properties we want.

For easy sanding, quick grab and high strength, we use a hard cross-linking polymer in our Aliphatic Resin

For our fast drying PVA, Speedbond, we use a pure PVA system with coalescing solvents to speed up drying. We do not use fillers to bulk and cheapen the glue as these can, over time, weaken joints.

For a good, clear flexible bond to plastic use R/C Modellers Glue. This adhesive will also gap fill and bond painted surfaces and plastic covering film.

Epoxy Adhesives

The well-known adhesive strength of epoxies is due to the strong polar bonds it forms with the surfaces it comes in contact with. Inorganic materials such as glass, metals, etc. form particularly strong bonds and hence can be used with glass composites. One square centimetre of an epoxy is capable of holding 300 kg in weight!

The advantages of epoxy adhesives are several:

Epoxy glues don't require anything other than the chemicals themselves to cause the cure. Other adhesives require the presence of moisture or absence of air. Thus the bond strength is highly reliable, consistent and not subject to environmental factors.

Epoxies also exhibit high cohesive strength due to their highly cross linked structure, thus giving great strength across gaps.

A large choice of hardeners is available to the formulator, giving setting times from minutes to hours. Thus they can give

modellers plenty of adjustment time without losing strength.

Similarly, different hardener chemistry can be employed to change ultimate bond strength, as shown in the example of the three types of Speed Epoxy II in Figures 4 A & B.



The development work conducted for two of latest epoxy products is explained below and help to illustrate how we have used our chemical skills to formulate epoxies for the modeller.



PROMOTIONAL FEATURE

Fast Curing Epoxy

Developing our new fast setting epoxy, 4 min. SpeedEpoxy II has been a particularly interesting piece of work. Having identified the key performance benefits we then set about designing the hardener and then fine tuning the epoxy resin to match it (flow properties). These were the properties we thought modellers were looking for from an epoxy adhesive:



4 min. SpeedEpoxy II has been finely tuned for modelling applications

- High strength
- The right balance of setting time and flexibility, i.e. non brittle
- Sandability
- Mix ratio tolerance up to 10%, to cope with errors occurring with small 2-3 g mixes

Working through over 40 variations of hardeners and epoxy resins, we found the right balance of cure time and flexibility. Shortening the cure time would result in a film that was too quickly cured and tended to brittleness but delivered mix ratio tolerance, whereas extending cure time a little introduced flexibility and toughness into the bond. See Fig 5.

The adhesive's properties were then all assessed for cure time, flexibility, ease of sanding, mix ratio tolerance, (90/100, 100/90) using hardwood test pieces and the final formula fell into the dotted area shown.

In a second example we have also developed AeroT<ch, a special epoxy product for bonding formers into glass composite fuselages for model jets etc.

Again, using market research and modelling know-how, we identified the following features required of this advanced epoxy product:

- High adhesion to composite surfaces making it ideal for highly stressed parts, e.g. engine mounts, control horns
- Thixotropic, non-runny in use so it did not flow away from joints whilst setting
- Gels in 3-4 hours, with full cure in 24-28 hours
- A visible bond, so you can see where the glue is

You can see from the strength data in Fig 6 how AeroT<ch epoxy has been successfully 'tuned' to give the highest strength to composites. **RCMW**

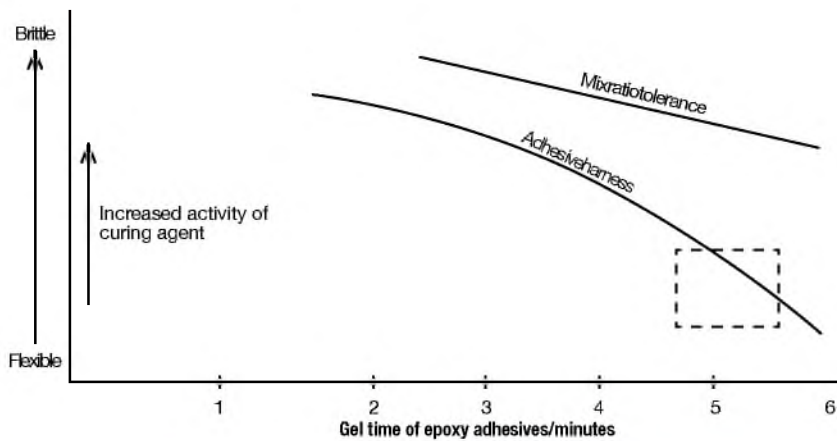


Fig 5 – Extending cure time introduces flexibility and toughness into the bond



The adhesive's properties are assessed using hardwood test pieces



AeroT<ch is ideal for bonding formers into glass composite fuselages



AeroT<ch forms a visible bond so you can see where the glue is

Hints And Tips For Using Epoxy Glues.

Measure resin and hardener accurately
 Mix thoroughly – you can't over mix!
 Don't mix too much at a time, 20 - 30 ml max
 Ensure surfaces to be bonded are clean and abrade if possible. Acetone is a good surface cleaner

Always keep hardeners and epoxy glues off your hands. Wipe adhesive away and wash hands with soap and water if contaminated
 Keep away from excess heat and light, especially hardeners which are the most sensitive

You can re-use crystallised solid epoxy resin by melting the white crystals with warm water

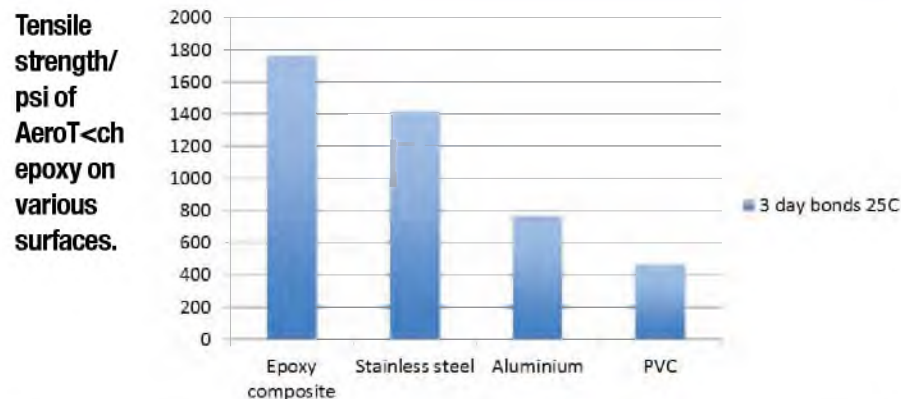


Fig 6 – Strength data for AeroT<ch epoxy



Model Mangles

Dave Goodenough looks back at some model crashes at his local club and concludes, 'Don't blame the glitches!'

A visiting club pilot gets it all wrong on his 'arrival' – look for the nose-leg!



Even good guy Thierry suffers 'the walk of shame' after his wayward FunCub attacked an off-piste tree and lost!

Stupidity is a wickedly contagious disease and it sweeps through model clubs with no thought of any eventual outcome. I was thus afflicted after a particularly nasty 'vertical vector virus' began to infect us unsuspecting Breton wing wagglers, laying waste to foamie ARTF and built-up beauties alike.

It may have been Dane, my Brit clubmate, that became our local Typhoid Mary. But as he'd scuttled off to Blighty recently we couldn't have him tested and cultured for proof of the dreaded plague.

A recent plummet of his donated 'Baron' indicated that the first stages of the infection had taken hold, but 'Kit Killer' Kevin was



Michel shows what happens when his flying wing interacts with Mother Earth once too often!

the first to exhibit full-blown symptoms. Unfortunately, I too rapidly succumbed to the ravages of this fecund infection and subjected my own dear model to a 'tent peg arrival'.

In an attempt to purge the last after-effects of my slow recovery, I lay before you a tortured heap of model miscellany...

Blanik Blundering

Following a mostly frantic couple of early flights with his new out-of-balance foamie Blanik electro-glider, Killer Kevin had finally come to terms with his own misgivings and had listened to advice to relocate the Centre of Gravity, originally specified by the maker

too far back, to a properly calculated spot. As later weekend sessions proved the big foamie had become a benign sweetie and it massaged his 'I'm a pilot, me!' nodes, beguiling him into thinking all was perfect.

Yet another balmy late summer Saturday morning heralded a comfy flying day to come – more terrain tickling than piste punishing. Us hardy Brits arrived early to make certain that we had our charges primped, prepped and otherwise fettled before the ravaging French hordes arrived after their extended lunches, to consume all the available pits space – again!

With no limit to air time so early in the afternoon we flew almost non-stop for nearly



Yann takes his battered FunCub into the trees – the plague has started to affect him



Honourable scars? Yann's Cub bears the signs of serious substance abuse. Cyano fumes can bend your mind – and model!



Kevin's Habicht decorates the runway after an unsuccessful attempt at burrowing



Even EPO has its limits. See what happens when you push a Hyper Bipe a bit too much...



Almost! A 'small' 2.5 m Cub gets entangled with Frickes' four metre span monster. Both survived

an hour and a half, so much so that we needed a recharge for both LiPo packs and stiff necks! Whilst I brought my little 'Sunbird' down from yet another thermal gambol, Kev strode out manfully to the pilots' position by the runway, self-launched yet again with his new-found aerial assertiveness, and proceeded to nurse nascent thermals into some form of acquiescence. He was a very happy glider-guider and for once his naturally 'mercurial' personality was calmed; he was one very happy Blanik bunny... But then the dreaded disease struck!

Happily assembling my new 'light of love' – the 2.2 m 1923 English Electric 'Wren' – I heard the first signs of aviation stress. Not 'Mayday', more a case of 'Oh, c**p!' Kevin's cry was followed by a long whistling sound, then an ominous 'WHAP!' Tortured EPO

foam has a sound all of its own, especially when driven into dry, hard-packed earth at just subsonic velocity!

Fearing – and expecting – the worst, I raised my eyes from the depths of the Wren's fuselage; Kev was already walking dejectedly into the off-piste undergrowth to unearth his most recent 'accident'. A few minutes later our rotund rambler returned to the pits, liberally decorated in burrs, seed pods and bits of Blanik.

I've seen models in a worse state, but not often. He'd really outdone himself this time, with the whole of the fuselage forward of the nose rendered to fragmented foam. The remainder of the body was simply snapped in two, with the fin found several metres away.

Our model murderer was perplexed, if not downright baffled. "It just stopped

responding!" he bleated. Oh well, the wreckage was tossed in the back of the van and another 'victim' selected – his nearly new Pilatus PC9, complete with its mighty ASP 1.20 glow engine. Fully fuelled and waiting for attention – it had recently suffered a partial fuel blockage – Kev switched the transmitter on, and then the model. "What's that beeping noise?" I asked, "...have you switched the motor cut on?" No was the answer. "The transmitter started making that noise when I was flying the Blanik."

Many of you out there will have got it already – it was the low battery alarm! Low voltage, naff-all signal and an unceremonious end for a very nice glider was the result. I'll draw a curtain over the next couple of minutes, but it involved curses, threats and a serious doubt about Killer Kevin's parentage!



George's mighty 'Excalibur' rests in our pits-side container, waiting its turn to tilt at the joust



'Excalibur' meets its end in the Arthurian landscape of the Broceliande. It 'fell to rest' after a particularly vicious tip stall. RIP



Left: Even super builder/flyer Johann suffered from the dreaded disease. He (left) and Jean-Luc carry the result of a nasty whoopsie

Immunity – No Chance!

With heart rate easing I left our modelling Luddite to field charge his transmitter battery while I attempted to explore the obviously buoyant air over the heathland. My little 'Sunbird', despite its humble design and origins, has been a super 'all things to all men' model; it thermals, does simple aerobatics with ease and simply gets on with whatever I tell it to do through the sticks, all on a cheap-and-cheerful power package. Today was no different, with the transition into glide following a smartly executed climb-out; all easy stuff and setting the model up for another comfortable thermal sniffing ride.

Overconfidence and assumption can be cruel, as are massively powerful thermals! Very rarely at the runway we have a curious 'hot wind' effect, culminating in the generation of powerful 'dust devils'. Imagine a thermal concentrated into a broad spinning vortex, if you will. They only rarely lift detritus from the ground and usually manifest themselves as a sudden increase in local wind that changes direction rapidly as the phenomenon passes over the piste.

As I was clawing for height with the little motor glider it suddenly leapt upwards – it's the first time I have ever uttered a worried profanity when everything was actually going right for once! To me it was just a powerful boomer of a thermal, though I'll admit I was perplexed at the rate the Sunbird was ascending. Staying within the updraught the model rocketed skywards, finally reaching

'not sure what it's doing' height. Needing some positive input to bring it back to earth, or at least a sensible flight level, I shoved some 'down' into the elevator. The model shrugged it off and continued upwards, despite the nose down attitude.

A bit of panic ensued, as did some more 'down' input, still with no discernible effect. I'd only once lost a model in a thermal before and that was free flight, so there was no way I would let this little sweetie shrug off its radio control!

By now I was quite concerned that I wouldn't be able to see, let alone accurately control what the little model was doing so I fed in a bit of power to the motor – would that help? The thrust from the baby outrunner certainly slowed the rapid rise so I gave it a bit more oomph, thankfully arresting the elevator-like climb, but the model looked odd, hanging in the air with the nose down at around 45 degrees.

By now frantic, I fed in more power and the model began to descend, before it left the malign influence of this thermal oddity and suddenly accelerated downwards! Little 'stick and film' models are not designed to fly like 'hotliners' and the Sunbird took exception to being treated so harshly, fluttering its wings in annoyance...

Hang on! My slowly seizing mind processed that last piece of audio-visual information; wings only flutter when in real distress, or when some aerial dimwit has pushed an airframe too far into Vne (velocity, never exceed) territory.



Even indoors the foul plague strikes! Dede's 'Phaser' attempts a re-kit via the gymnasie basketball net

BRIT IN BRITTANY

Plane too fast, fingers too slow and terrified, I chopped the power and eased the elevator stick back – the first too late, the second too soon – only to see the glider begin to level out, but with more dihedral than it was originally built!

Nursing the wounded bird around to attempt a gentle return, I forgot about the powerful thermal activity – I'm a chap and think of but one thing at a time; it's our better halves that can multi-task! Taking a long approach over the trees that bound our flying site I also forgot that thermals 'break away' at that leafy air barrier. and I wasn't lucky. Even with its aerodynamics compromised the Sunbird began to climb again and for the first time ever I cursed the ease of catching thermal lift and stuck the nose down once again...

Unlike most fairy stories there was a grim, not Grimm, ending. The stress was too much for the weakened wing and the 'dihedral' increased as the model's height decreased, ending in full structural failure. The wounded wing flipped over and 'clapped' the other, then the cheery little yellow-winged bird began its rapid death dive in a slow rotation spin. I looked on helpless, fingers frozen on the sticks. It struck the outfield tussocks with barely a sound, followed by my feelings, accurately voiced by mate Yann. "Merde!", he said. Just so, thought I.

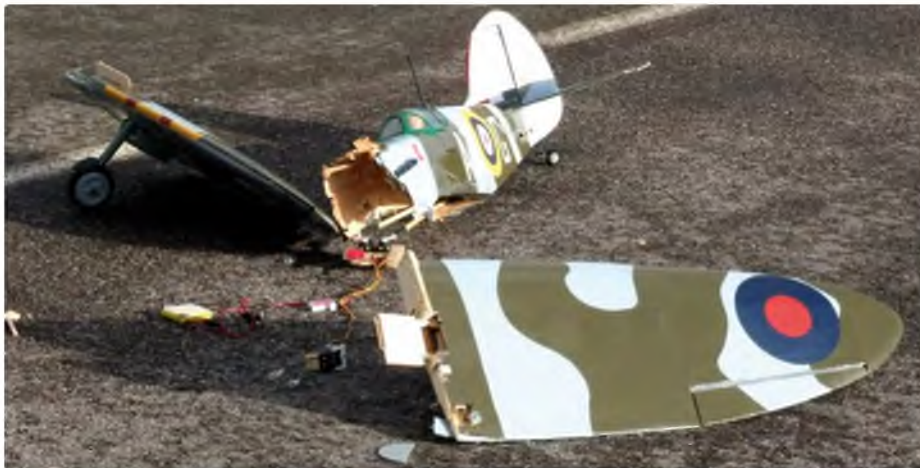
At first the pile of crumpled balsa inside a plastic bag of covering looked awful, especially as all the avionic innards had become 'outwards', with the battery only found after a scrabble in the underbrush. No tears or recriminations – I'm made of sterner stuff! It now lays in the corner of the toy room, awaiting resurrection – perhaps...

Reverting To Type?

Early to the runway for a French flyer, and the first of the day, 'Jaques le Splatt' began to unload his new, expensive ARTF purchases – all three of them! The Cassutt (his second) we'd seen but once before, but the Bell P-39 Airacobra and P-51 Mustang were brand new and unsullied by fuel, hangar or runway rash. 'Splatt' has a poor reputation for model longevity and is well known for strewing models – both whole or forcibly dismantled – all over the local landscape. He even has his own, named, pockmark in the runway, care of a previous DLE 55 powered bolide that landed vertically with 'extreme prejudice'.

The P-39 drew the short straw and was posed on the sacrificial altar of his starting stand. He had a cursory run through of its operations – including the retracts fitted to the distinctive 'stilty' undercarriage – then fuelled it to the brim in preparation for its maiden flight. The ubiquitous DLE 55, of which he has several, was fired-up and revved a few times, before Gentleman Jaques lifted the lump onto the tarmac and began the tick-over trudge to the runway. Another quick burst of revs proved the engine transition and with the motor returning to something near low speed he released the 'Cobra and ramped up the revolutions once more.

The rest of the take-off was a non-event, with the big scale beast doing exactly what was wanted of it. The lift off after a long run was perfect, as was the aerodynamic balance when tested in a rare low speed check out. For most of the flight the big DLE engine stayed flat out, pushed to the limit.



Tyro pilot 'Kevin' flew his Spitfire into a particularly nasty 'rotor' behind the trees bounding our site. The 'grabbing hand' swatted his model from the air



My own Precedent T180, a veteran of many enjoyable years, proved that models won't fly without a fin! It was worse than it looked



It's called 'FunCub-itis'! The need to attempt ever more risky manoeuvres, then fail miserably. The disease increases cyano sales in proportion to the spread of infection...

With most 'Splatt' flights you know when he's going to start his landing approach, as the engine note falls to less than frantic! Us reduced-to-audience Brits looked up as one to see the P-39 'arrive' somewhat untidily. He'd done it again – too little power and too long a stretch on the atterrissage meant that he'd dropped into a stall at the last moment. The long nosewheel leg took

the brunt, twisted sideways and caused the tyre to act as a brake against the runway surface. Monsieur 'J-le-S' never, ever makes mistakes – he'll tell you that himself – so he ranted about the iniquity of manufacturer's poor quality control, weak retracts and even the little grass tufts in the runway joints, all whilst portaging his wounded warbird. We humble Brits knew better!

Strike Two?

The P-39 was sidelined; what poor trembling device would he choose next? As a 'known to him' avionette rapide, Jaques dragged the reluctant Cassutt pylon racer from its nest, fuelled up and shoved the electric finger into its nose. Stuttering uncomfortably, it rolled towards the runway, making the occasional attempt to escape

sideways (the tailwheel was misaligned with the rudder). A big handful of 'go' had the unfortunate speedster racing away into a rapid climb, the throttle not being touched again, until several minutes later something untoward happened; the big petrol lump up front started to complain!

Almost in concert with the farts and splutters from the seriously annoyed engine,

'Splatt' began to chant curses, wave the transmitter sticks around and, we thought, lined up for an emergency landing. Not so...

He just kept going, probably hoping that the engine fault would simply go away. Well it didn't. Popping and banging like an old stationary engine, the DLE was in serious 'I don't want to play' mode and becoming ever more unenthusiastic with the pilot's ministrations.

Finally, realising that he was fast running out of meaningful model momentum, Jaques began an approach circuit. All too late of course; the faltering fifty-five had played long enough and shut up shop – it simply died. The silence, even from the now panicking J-le-S, was deafening!

Despite his proven ability on the sticks (he's qualified to show level...) our perspiring pilot turned downwind at the wrong moment, exactly what we are taught NOT to do. Obviously realising that he'd made a right rickets of the dead stick approach, Jaques attempted to turn into wind again, too low and too slow. A classic c**k up! With barely enough impetus to keep it airborne the crosswind plane managed to smite the runway good and hard before the compressed undercarriage struck a runway edge tussock.

The evolution that followed was extremely entertaining for us minor mortals. Just as the legs released their stored energy they also tripped over, with the Cassutt performing the sort of somersault that even Tom Daley would have been proud of; had it been a yacht you would have described it as 'a perfect pitchpole'!

Of course, it was not Jaques' fault. The grumbling Gallic de-fuelled his models, dismantled and then lobbed them in the back of his 4 x 4, and left in a huff, spraying car park gravel – yet again! Nothing ever changes...

I wonder what he'll bring next time?

Convalescence

The worst of the disease is now over, as another putter at the piste has proved. The sun shone, the batteries stayed charged and we Brits warmed ourselves in the afterglow of another fine flying day, playing nicely with our toys, just as our wives told us to.

As we were attempting to get all the models back into the too small car, club Patron Roger thrust a large and untidy cardboard box at me. "You fly gliders, build this one!" A request or order? I have no idea, only that I had been given a 'freebie'. More model machinations allowed the box to be wedged in and, once home, I opened it. My first thought was 'that's nice', but on reading the kit specs my comment changed to, 'oh, poo!'

It's an early 'hotliner', the Simprop 'Selection' of 1700 mm span, a 'Hot As Hades' plaything that was originally intended for a 600 series brushed motor and heavy NiCad cells. Weight rated at up to 2 kilos, new power and avionic advances means I can probably shave 500 g from that total, possibly more, plus have a vast amount more power on tap – we shall see.

Being a German Simprop kit it is beautifully prepared and the one-piece obeche veneered foam wing is seriously rigid – it will need to be with all the planned power available! Whatever happens, you'll read about it here first.

Pray for my aeronautical soul! **RCMW**



After the 'infection' claimed Jaques le Splatt, his Airacobra came to rest in the weeds after his 'clobbered nosewheel' incident



'Splatt' taxis the Cassutt out to the runway. It all went pear shaped later



Jaques hauls the Cassutt off the ground in a leap of faith – unfounded as it happened!

Jeti DC-24

Frank Skilbeck flies with Jeti's top line R/C system, which is aimed at turbine jets, moulded gliders and other high performance model aircraft



The DC24 design is distinctive and modern. The transmitter is available in a range of case colours and fascias

Switches and controls all have a high quality feel. Switches can be changed, moved or removed to suit user preference

Jeti were formed in 1993 by Mr Jelen and Mr Tinka with the aim to produce electronic items for modellers, initially concentrating on speed controllers. They were one of the first companies with a range of controllers for brushless motors. With the introduction of 2.4 GHz for radio control Jeti expanded into this arena, initially producing a range of modules and add on telemetry displays, using their Duplex transmission system, for installation in other manufacturers transmitters, it was only logical that they would start to produce their own transmitters.

When Jeti did enter the transmitter market it was with their distinctive DC and DS transmitter line up featuring CNC machined cases and gimbals using hall effect position sensors, setting them apart from the mass market and positioning them as a premium product.

Now Jeti have taken the next step in

providing a robust radio link to your model by introducing the DC-24, which transmits on 2.4 GHz with a 900 MHz back-up system and incorporates a colour display and haptic (vibration) feedback through the sticks, plus an FM radio tuner and the ability to play back MP3 files.

Triple Transmission

The Jeti Duplex system common to all their transmitters uses dual 2.4 GHz transmitters, each with their own twin aerials arranged for optimum transmission coverage and capable of being configured to transmit on separate channels to their paired receivers, not only providing additional diversity but also reducing the chance of lost information frames if other hopping systems are broadcasting on the same channel.

Now Jeti have taken this a stage further and added a third back-up transmission

system on the 900 MHz band, 863 to 870 MHz in the EU and 902-928 MHz in the US, that takes over if the 2.4 GHz transmission is compromised. The very nature of the frequency hopping spread spectrum 2.4 GHz systems means this is highly unlikely to occur when operating in conjunction with other similar systems, but this insurance provides a completely independent back-up, providing additional reassurance and peace of mind for those highly prized models, especially when operating from a site that may be subject to spurious 2.4 GHz transmissions.

When using the regular line of 2.4 GHz receivers it's possible to utilise the standard Duplex system 2.4 GHz and add either a second receiver or Rsat if desired, or a 900 MHz Rsat and have a dual 2.4 FHSS transmission with 900 MHz back-up. If using one of the central box power distribution systems then it is possible to attach two



The main case is machined from lightweight alloy. The sticks fall easily to hand for pinch flyers, while shorter sticks are available for thumb flyers



Support arms for use with the Jeti harness bolt directly onto the case. The arms fold down to fit the transmitter in its case and provide protection for the sticks in this position



The carry handle houses the 2.4 GHz and 900 MHz aerials. The socket in the handle is for a PPM stream for use with flight simulators and also external devices, e.g. FPV head trackers. The ports on top of the transmitter are for the charger and a USB port for hooking up to your PC



Removing the rear cover reveals a well thought out design. All boards plug into each other and the switches plug directly into the boards also. The only interconnecting cables are from the gimbals



The three separate transmitters are shown here. There are two 2.4 GHz transmitters, each with twin aerials for diversity, and a single 900 MHz transmitter



Stick gimbals with hall effect position sensors are CNC machined and adjustable for spring tension and ratchet. They can also be rotated to follow your natural hand movements. Note the haptic vibration units at the base of the stick



Programming is by the buttons and the 3D wheel on the lower right of the transmitter

2.4 GHz RSat remote receivers, each bound to their own 2.4 GHz transmission system in the transmitter, together with a 900 MHz Rsat acting as a back-up. With this system a failsafe lockout due to signal issues is reduced from highly improbable to practically impossible.

Hardware

Having a robust transmission system would be a benefit on any system and as expected the Jeti DC-24 hardware builds on the design and construction of the DC-16, adding a colour screen, haptic feedback through each control stick and voice control to the existing hall sensor CNC gimbals and machined alloy case, providing a distinctive high quality system.

The gimbals can easily be adjusted for tension, throttle ratchet strength and rotated if required. Opening the case also shows the layout of the electronics and it's clear that a lot of thought has gone into the design; all the separate boards plug directly into each other and the switches plug directly into the circuit boards too. The only interconnecting wires are from the gimbals to the circuit boards. Not only can the supplied switches be reconfigured to suit user preference but they can be removed altogether or replaced with one providing an alternative action, i.e. momentary or 2 or 3 position. Provision is also provided for stick end switches, meaning pinch stick flyers can activate functions directly from the sticks.



Power is provided by a 2S 5200 mAh Li-ion battery. Battery life is around 12 hours, which is more than adequate for a day's flying. A charged spare could be carried as a back-up for weekends away when without access to charging facilities



Main model screen is user configured. Here the primary display has been set to show the supply voltage and signal quality at each of the RSat aeriels. Note the screen background colour and model image can also be changed. Model images can be loaded from your PC via the USB interface

As supplied all the switch sockets have been utilised and the DC-24 has one 2-position momentary switch, four 2-position switches and five 3-position switches, in addition to two shoulder rotary sliders and two rotary control dials either side of the large 320 by 240 pixel backlit colour display, which is positioned at the top of the transmitter for easy viewing. Below the display there are a row of five function buttons, which can be programmed and are used in conjunction with the rotary encoder at the bottom of the transmitter during model programming.

The advanced transmission system and quality hardware would be wasted if the programming didn't match and predictably the programming is very powerful, with features for just about every possibility, including 10 flight modes, 24 logic switches,

24 remote commands, 10 sequencers, 30 free mixers in addition to the aileron differential, butterfly, V-tail and snap flap mixers and the ability to use up to 16 telemetry controls.

Programming is accomplished using a 3D rotary control together with a menu and the ESC (escape) button on the lower right hand side, together with the five function buttons under the display. The programming menus are entered by pushing the menu button and then using the 3D rotary control to scroll through the various menus. You enter the relevant menu by pushing the 3D rotary control, with the ESC button taking you back up the programming menus when required.

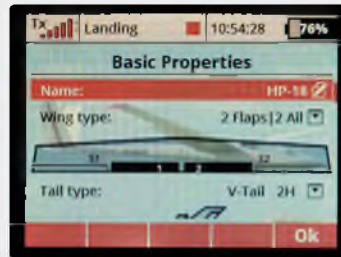
Covering all the programming options would take up far more space than is available for a single article and in any case



Using the function buttons underneath the screen you can scroll between the different, user configurable telemetry screens. Here the second of three screens shows the output of the vario sensor and also the receiver battery mAh consumed



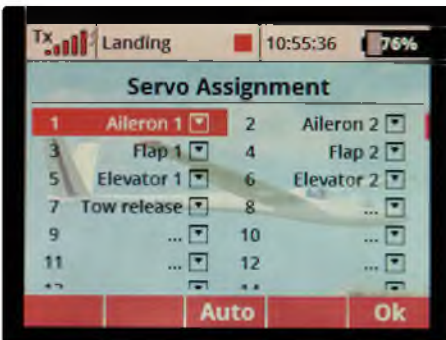
Programming is entered via the menu button, which takes you to the various menu options. Scroll down to the relevant option and the relevant sub-menus can then be accessed



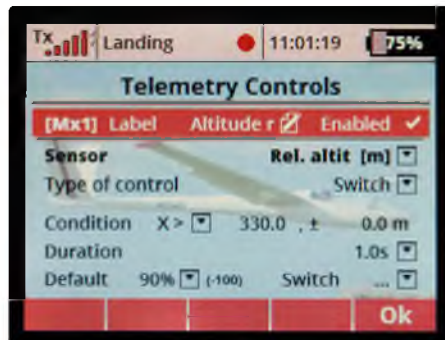
Setting up a new model is by selecting the wing and tail types. The DC-24 then allocates the relevant servo channels and controls, all of which are editable in other menus. Scrolling down this screen allows the number of engines, air brakes, retracts and gyros to be specified as well



The functions assignment menu allows the controls/switches for various functions to be selected. Apart from the basic functions the other functions are named by the user



The servos channels are assigned by the transmitter once the wing type etc. has been defined. But they can be changed in the servo assignment menu, or multiple channels added to a single control



Telemetry values can be specified to activate controls. Here the relative altitude sensor will activate control Mx1 when the height exceeds 330 metres. In this instance Mx1 was used in a logic switch, with a toggle switch to activate the tow release so that the release triggered either when the glider exceeded 330 m or the toggle switch was activated

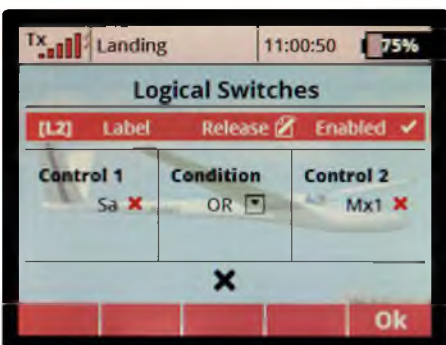
is more than adequately covered in the clear, well written manual, which can be download from either the Jeti or E-Soaring Gadgets websites.

Special Features

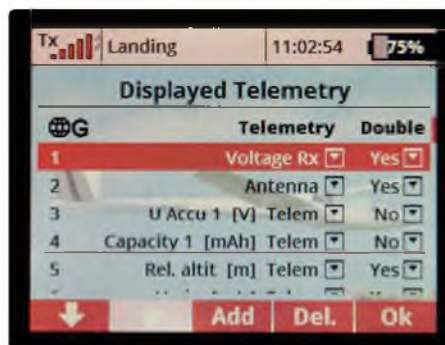
A new feature introduced in the DC-24 is the addition of voice control, although Jeti warn that this is still experimental and shouldn't be used for any critical flight functions. This system allows you to record a command via either the in-built microphone or an external one connected to the phono socket. The command can then be activated by a command switch, or master voice command, and then the instruction is given. This could be useful for asking the DC-24 to read out telemetry values, i.e. rather than having different switches for key telemetry variables you could have one master switch and then verbally ask for the value, e.g. battery remaining mAh, amps, height etc. Although you may get some strange looks from you fellow flyers when they hear you talking to your transmitter!

Haptic (vibration) has been incorporated into each control stick so rather than vibrate the whole transmitter when a telemetry alarm setting is activated you can assign this to vibrate either of the two control sticks, with various settings for the vibration feedback.

Another useful feature that is common to the other Jeti transmitters is the ability to configure the receivers, including the Rsats, central box distribution units and other accessories, directly from the transmitter via the device explorer menu, allowing things like the communication protocol, central box socket functions, servo frame rate etc. to be set without having to hook these devices up to a PC or programming device.



Logic switches can be set up. In this instance a telemetry height control, Mx1, was used in a logic switch with a toggle switch, Sa, to activate the tow release so that the tow release actuated either when the glider exceeded 330 m or the toggle switch was activated



The main flight displays can be configured to group the telemetry information as required. Note the option to have values displayed double size

To further enhance the already impressive programming capabilities the DC-24 can also run LUA scripts. This allows those with an interest in programming to develop programs to add additional subroutines; even if you are not that way inclined a quick search on the Internet reveals LUA scripts to change the function of a spring loaded switch into a momentary switch and the ability to change telemetry readouts from absolute values into percentages, and I'm sure savvy users will develop more in due course.

In Use

For testing Jeti UK provided the DC-24 together with a R9 nine channel receiver, a Central Box 200 with two 2.4 GHz Rsat2s, a 900 MHz RSat, a vario sensor, 75 amp sensor and a 6S LiPo voltage monitor.

To test out the system I programmed in a simple low wing electric model with separate nose wheel steering and a 1/4 scale V-tail glider with flaps.

Setting up a new model is straightforward, going through the model set up menu to specify the number of ailerons, flaps, type of tail, number of retracts, airbrakes etc., which then populate the servo assignments, all which can be user changed as desired. Additional functions can be added by naming

these functions and assigning the relevant outputs and controls.

For the low wing electric model I used an SM Modelbau Unisens sensor that records amps, mAh, flight pack volts and height, set to operate on the Jeti system. This required the receiver telemetry input to be set to Jetibox, where it then appeared on the telemetry set up menu, allowing alarms to be set for high amps, mAh limit and low flight pack voltage, with selected readouts on demand.

For the glider I wanted flight modes for launch, normal and landing, with different flap travel, via the side rotary slider, in launch and normal modes and butterfly (or crow) braking active in landing mode only. This was all easily set up by setting flight mode specific flap curves in the function menu and activating the butterfly braking, with elevator compensation in the landing mode.

I used the Central Box 200 with two RSat2s and a vario sensor for thermal detection and height read-outs. I also set up the vario to alarm at an over-height and using the logic switch I set the tow release to function if either the tow release switch was operated or the glider had reached a predetermined height.

A nice touch was to use the R/C switch that plugs into the receiver or central box and allows the model to be switched on/off from the transmitter. As a safety feature this only operates when the transmitter is in close proximity to the model and requires the action to be confirmed with one of the function buttons under the display. All very straightforward and, for added bling, I imported a photo of my glider and made it the background on the screen.

Using the brackets and harness supplied with the DC-24 the transmitter is well supported and fits comfortably with the sticks and all controls/switches within easy reach, providing you are at ease with a tray radio. For those that aren't then the DS series is best for you.

As expected model control was faultless and the stick movements were smooth and precise. The trim buttons are situated underneath the sticks and not in the usual position, but this is no real hardship, especially if using the auto-trim feature.

Auto-trim allows you to trim the model by activating the feature, whereby the trim will then move towards the stick position; so by holding the sticks to keep the model flying straight and level the trims will slowly move over until you have moved the sticks back



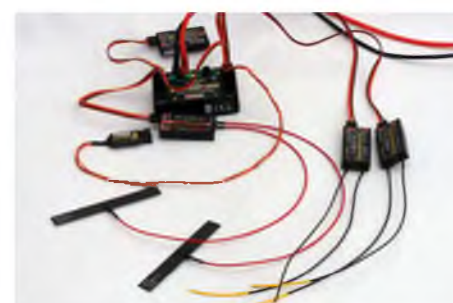
Dual Rate and Exponential can be set for each flight mode and are shown graphically. If you have dual servos you can set separate rates and exponential for each surface



Dual rate and exponential values are listed. The ailerons are flight mode specific and the rest are global. Highlighting and entering a control brings up that control's editing menu



Left: Function curves can be assigned to all controls. These can be a constant value, 3, 5, 7 or 9 point curves or one of six predefined types. They can be made global or flight mode specific



Right: The 900 MHz receiver is similar to the 2.4 GHz Rsat units except for the dipole type aerials. Here a Central Box 200, 15 channel distribution unit has been fitted with two 2.4 GHz RSats and a 900 MHz RSat, with a vario telemetry sensor and also a 2.4 GHz wireless switch that allows the system to be powered up from the transmitter



Standard R series receivers can utilise either a second 2.4 GHz or 900 MHz Rsat. Here a R9 receiver is shown with a 2.4 GHz RSat and a 6S LiPo voltage monitor sensor



A quarter scale Pat Teakle glider was one of the models used to test fly the DC-24. Here the Central Box 200 was used with two 2.4 GHz Rsats, the RC switch and a vario sensor

to the centre, the feature is then switched off and any residual fine trimming can be accomplished with the trim buttons. This is the first time I have experienced such a system and I can see great benefit in it, especially with models that are significantly out of trim.

While I didn't need to look at the colour screen during flying, instead relying on the voice announcements, the display was easy to read in sunlight. The display can also be customised to group user selected

information on different screens, as required.

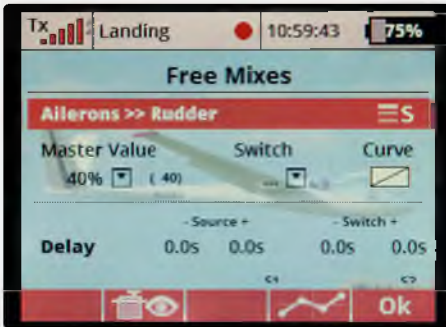
Summary

The design and construction of the DC-24 leave little to be desired and finding fault would be nit picking. The addition of a back-up 900 MHz transmission system to the Duplex 2.4 GHz system makes for a highly resilient system, providing reassurance, especially when operating valuable models at new sites or sites with incidences of spurious interference. However, the only

way I could test this feature was to disable the 2.4 transmissions at the transmitter or by removing the 2.4 RSats from the Central Box 200.

The 900 MHz back-up system alone would make this system stand out but in addition the haptic vibration through the sticks, voice control and colour screen move this system even further ahead, although the penalty of having the backlit colour screen is a reduction in operating time with the supplied battery to between 10 and 12 hours depending on the screen brightness...

The programming is common to the DC/DS 14/16 series and uses a reasonably intuitive menu system, making the transition from other sets and access to the advance features fairly effortless. Even though the printed manual in the review set was in German and the English version was only available as an electronic download, once through the initial set up the manual was rarely needed. However, we have been advised that an English printed manual is now included for English speaking countries.



There are 30 free mixes available, user named, and they can be assigned various curves, delays etc. as required



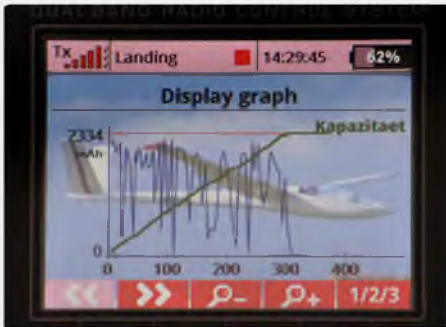
The DC-24 has extensive user configurable data logging capabilities to log both telemetry and transmitter control position data

Only As Good As The User!

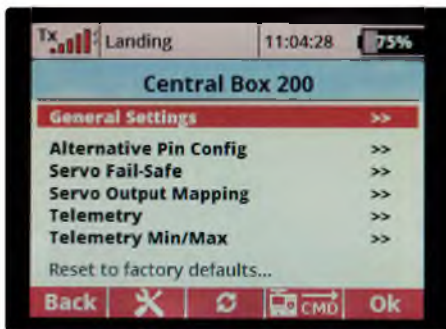
Just as a post review note it's worth mentioning that as with all these systems it's often 'rubbish in, rubbish out'.

As an example, I'd set up a height alarm on my glider for 450 m (1500 ft) to comply with a NOTAM at an aerotow event, even though on the day the thermal activity meant that this wasn't needed. But at a later slope session the height alarm kept going off, even though the height reading was less than 100 m.

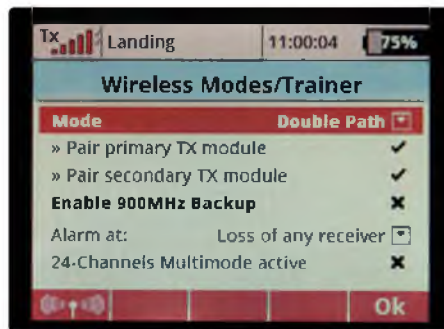
After a few seconds head scratching I realised I'd set the height readout to be relative to the launch point and the alarm to be absolute height – and as the launch point was now some 350 m above sea level the alarm did as instructed! **RCMW**



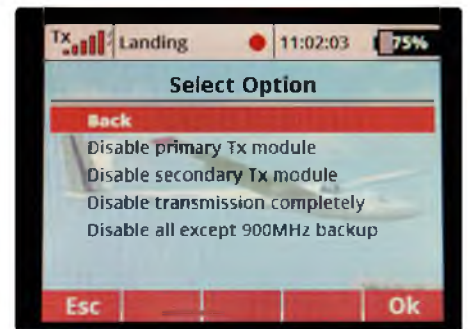
Left: Information collected by the DC-24 data logging can be viewed on the transmitter screen. Shown here is information from an SM Modelbau Unisens E sensor displaying flight pack mAh used (green line) and the left hand scale, together with the current (blue line) and the signal quality (red line). The data can also be later downloaded to your PC and analysed in either Jeti's flight monitor program or a third party program, such as Data Explorer



Using the device explorer menu the receiver and telemetry sensors etc. can all be configured from the transmitter. This menu shows the various options for configuring the Central Box 200 power and control distribution unit



The wireless operating modes can be set up in various configurations, including wireless trainer mode and the 900 MHz back-up system



To show that all primary, secondary and 900 MHz back up receivers are functioning correctly the transmitter allows the different transmitter sections to be disabled

PRODUCT INFORMATION

NAME: Jeti Duplex Radio System DC-24 CARBON LINE
MANUFACTURER: JETI model s.r.o.
UK DISTRIBUTORS: Review set loaned by eSoaring Gadgets UK.
 Also available from Electric Wingman & Jettstream.
WEBSITES: www.jetimodel.com, www.esoaringgadgets.co.uk, www.electricwingman.com
 and www.jettstreamuk.co.uk/
PRICE: £1445.00

TECHNICAL SPECIFICATIONS

WEIGHT: 1500 g
DIMENSIONS: 230 x 270 x 40 mm
 Output Power, 2.4 GHz: 100 mW
 Output Power, 900 MHz: 25 mW
NUMBER OF CHANNELS: 24
NUMBER OF CONTROLS: 20
RESOLUTION: 4096 steps
TELEMETRY: Yes (up to 40 values can be displayed)
OPERATING TIME: Up to 12 hours
COMPATIBLE PROTOCOLS: DUPLEX 2.4 GHz EX, 900 MHz, EX Bus



DC-24 is supplied in a well padded, lockable metal case

eSoaring Gadgets home of **JETI UK**



COMING SOON!
The brand new DS-24 Jeti Radio will be arriving Summer 2017!



Specialising in products and components associated with model aeroplane modelling and flying. We have a very experienced technical team who are always available to answer any questions you may have.

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or call 07740 181861 between 2pm and 8pm weekdays and 9am to 8pm Saturday

www.esoaringgadgets.co.uk
home of



eSoaring Gadgets UK 15 London Road,
Hassocks, West Sussex, BN6 9NT.

We are the Jeti UK and Ireland main Distributor and trade enquires are welcome!



Nuremberg Drones On!

In recent years the main R/C hobby hall at the Nuremberg Toy Fair, held this year in early February, has seen an influx of more and more companies, many from China, offering a bewildering array of camera drones, racing drones and lots and lots of budget level (toy!) drones. We appreciate that many of these aircraft are of limited interest to our readers so if you want to see a more detailed report on more of the enthusiast level multirotors featured at the Toy Fair then please grab yourself a copy of the next issue of our sister magazine, RC Flight Camera Action. Here's just a small taster of the multirotors on display, with pictures by Barry Atkinson

UDI R/C

www.udirc.com/drone

www.ripmax.com



Left: Foldable drones for taking 'selfie' pictures are on the rise. This U'Wing foldable drone from Udi R/C is equipped with an HD camera and built-in altitude hold function to hold station while you capture pictures of yourself with friends and family



Right: U'Fusion is a 5.8 GHz FPV headset that can be used with most drones fitted with a WiFi enabled camera. It will give a 'drone's eye' view of your flying area. For full details of Udi R/C products please visit the Ripmax website

TOY LAB

www.toylabrc.com



Drones need to be a bit unusual these days if they are to stand out from all the clones. This S-shaped quadcopter looks a bit like a praying mantis or cobra about to strike!

Left: Small racing drones could be just the thing to add a bit of sparkle to your club's indoor flying sessions. How about a one model series with something like these X Drone Racers, which were displayed with a selection of indoor gates and hoops

YUNEEC

yuneec.uk



Unlike a lot of the R/C model hobby companies the biggest names in the international drone business still deem it worthwhile to exhibit at the Toy Fair. Here is Yuneec's professional grade H520, a six-rotor drone with multiple camera options. When paired with a CGO-ET camera it can capture both thermal and night vision from a single camera, making it ideal for law enforcement, search and rescue and solar panel inspections

MJX R/C

www.mjxrc.net



MJX R/C have latched on to the fact that the headlights on their drones give them an almost insect-like look, hence the generic name 'Bugs' for many of their multirotors. A stand out feature of the Bugs 250-size racing drone is the six piece 14 mm all glass lens, which gives a 120° wide angle field of view with minimal lens distortion. The 1080p HD camera has a 1/4" CMOS sensor

HOBBICO

www.logicrc.com



A wide selection of Hobbico models and other products such as Tactic radios are now being distributed by Logic RC in the UK. This includes the RISE brand of drones. Here is the Vusion Houseracer, which is promoted by Hobbico as 'instant indoor FPV', although racing around the sofa is probably a bit easier in the average size American home than a two up, two down over here!

HJ TOYS
huajuntoys.com



This circular U-Fly FPV drone from HJ Toys features auto take-off and landing, an obstacle sensor, 720 x 1280 pixel imagery, record and playback via the FPV monitor, a 6-axis flight control system and a barometric pressure sensor for maintaining altitude when hovering. Quite a list...

GDU
gdu-tech.com/en



The Byrd from GDU is a fold up drone with a difference in that it is not just a selfie drone but is available with several camera and gimbal options. The 'Premium 2.0' version has a range of 2000 metres and comes with a 4K camera

DJI
www.dji.com



The real McCoy! This DJI Matrice 600 Pro is the sort of aircraft used for professional video and aerial photography, as we see almost daily on TV. Features include an A3 Pro flight controller, Lightbridge 2 HD transmission system, intelligent batteries and battery management system

MOLA
mobile.i-mola.com



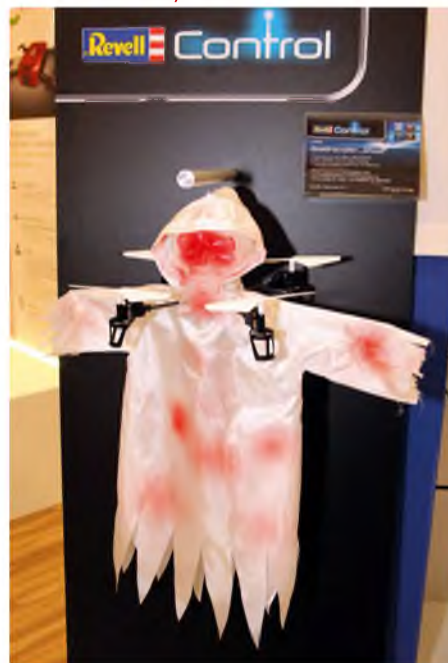
Top & above: UFO from Mola is a hand launched selfie drone with retractable arms, which allows it to be stored and carried in a CD player style case. Features include: vision lock, intelligent tracking, 3-axis anti-shaking for more stable image quality, 3D positioning and accurate hovering

EXTREME FLIERS
microdrone.co.uk



This WiFi Camera Module from Extreme Fliers shoots video in 720p x 1280 HD resolution and live streams to your smartphone. It is mounted to the Extreme Fliers Micro Drone 3.0 via three magnetic connections and is specially designed to attach both ways, forward facing or backwards

REVELL CONTROL
www.revell.com/radio-control



Here's a bit of fun from Revell Control. Due for launch in September 2017, in plenty of time for this year's Halloween festivities, this 'Ghost Quadcopter' features a headless mode for easy handling

PARROT
www.parrot.com/uk



Here at RC Model World we've been lucky to have test flown previous versions of the nimble Bebop fisheye camera drone. But despite the compact nature of the drone itself the Skycontroller transmitter supplied with it was a large piece of kit, resembling an oversize continental tray type Tx. However, this new Bebop 2 FPV package comes with a reduced size Skycontroller 2 and a Parrot Cockpitglasses FPV headset. The Skycontroller 2 is a much smaller and lighter transmitter, similar in style to the Minidrone Flypad that we recently reviewed, albeit with a large horizontal aerial array on top!

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Clubman pilots Mike, Alex and Phil at a competition at Hurley, all aiming for promotion



Clubman Aerobatics

As an experiment for 2017 pilots with a BMFA 'A' Certificate are welcome to fly at GBR/CAA aerobatic competitions



What we are all aiming at! The GBR Team 2016 at Ashbourne before leaving for the European Championship in Germany

The Great Britain R/C Aerobatic Association (GBR/CAA) offers a friendly hand to new members interested in taking their flying skills further by participating in precision aerobatic competitions. The Clubman schedule is designed as a first attempt to link the basic manoeuvres together, like loops and rolls positioned correctly in a sequence. This has been known as a turn-a-round schedule since the early eighties.

Ashley Hoyland, the Association's PRO, says:

"To encourage new pilots we already invite you to fly at your first competition without being a member of the GBR/CAA, but we do ask that you pay a small entry fee to help cover the cost of the competition. If you decide you want to join us our annual membership is £20 a year and the application form is here: www.emailmeform.com/builder/form/Ue21EB50ycjVIH5

All our entry forms are on line at: www.gbrcaa.org

So what is new? We are told by several pilots they would have a go at flying at a

GBR/CAA competition but they do not have a BMFA 'B' certificate. So as an experiment for 2017, and if the competition site allows, we will now accept entries from 'A' certificate holders to fly our Clubman schedule in front of our judges. Providing the local rules do not exclude you, your model would be checked over by a GBR/CAA pilot or the Contest Director and you would be accompanied and talked through what you need to do before the competition starts. You would not be expected to fly first, so you can see what others do, and your mentor would call the



A typical set up at one of our competitions. This was also taken at Hurley

GBR/CAA Clubman Schedule

From Jan 2003
21/12/2014: Take-off updated

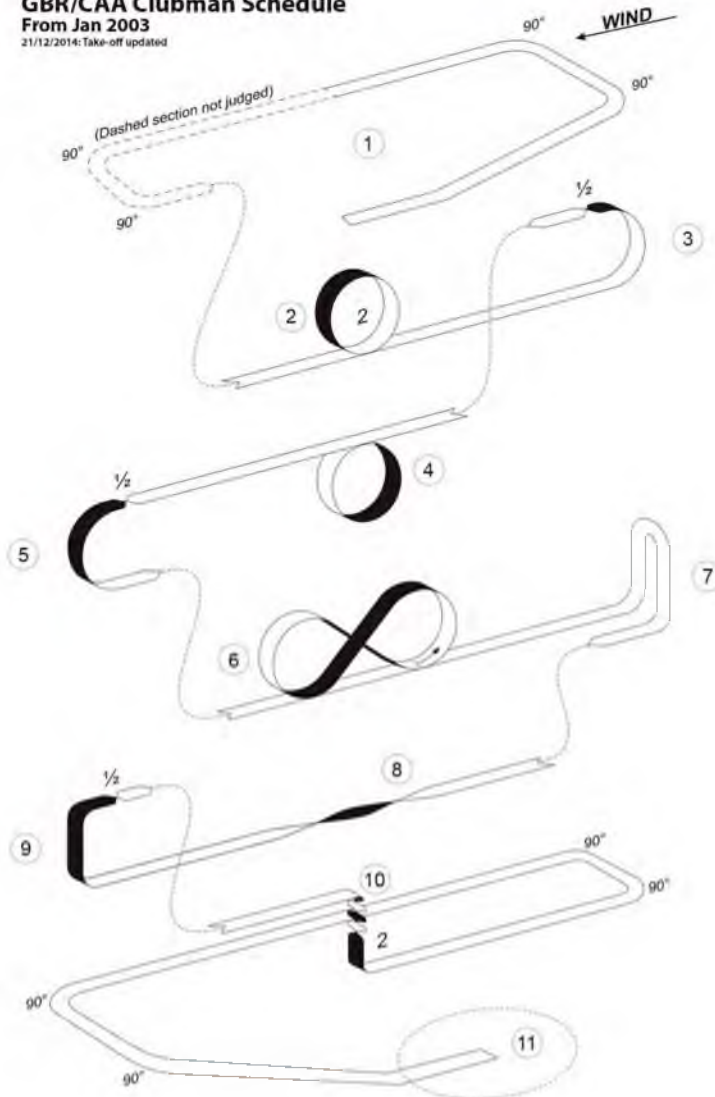


Fig.1: Ribbon diagram of the GBR/CAA Clubman schedule. Full details can be found at: www.gbrcaa.org/schedules.htm

schedule for you and generally be by your side throughout the day. Of course, any sign of dangerous flying and you would be asked to land your model

Any model under 7 kg, which meets the noise limit of the flying site and can do a couple of loops and rolls, is suitable. Our competitions start at around 9 am after a pilots' briefing is held to go through the rules of the site and announce the flying order. You should expect to have three flights through the day, although if there is time and with mutual agreement Clubman pilots may be asked if they would like four rounds.

You may feel that with just three flights in the day you would have long periods of waiting? Well this is not the case as we would ask you to take your turn scribing, and with lots of conversations for you to join in with time passes quicker than you think.

If you are travelling some way please give the Contest Director a ring to talk about details and any doubts you may have, and to find out what facilities are going to be available on the day. An overnight stay may sound a bit extreme for your first competition but consider it all part of the experience, and you will probably arrive at the flying site ready to fly in a better frame of mind than if you had an early start and a long drive from home.

The ribbon diagram of the Clubman schedule is copied here so you can practice, but please don't think you have to do fly the schedule perfectly before you fly in a competition. There may be some elements that need to be understood before you spend hours practising and you would pick these up at the competition.

There is lots more information on our website: www.gbrcaa.org

Or if you would like to talk, give me a ring on: 0114 2873432.

The main object here is to ask you to have a go. All our pilots agree that you learn more at your first competition than at any other time, so we hope to see you at a GBR/CAA competition in the near future." **RCMW**

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

Diary Dates

INDOOR

25th Apr, 30th May, 27th Jun '17

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

6th May, 3rd Jun, 1st Jul, 7th Oct, 4th Nov, 2nd Dec '17

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

9th May, 13th Jun, 12th Sept, 10th Oct, 14th Nov, 12th Dec '17

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

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

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

GENERAL

23rd Apr '17

F3A. BMFA 1st GBR Team Selection Event. Stansted MFC. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Mark Pearce on 01279 505798 or mobile 07764 681116 for details.

28th to 30th April '17

The ProWing International Trade Fair will take place at the airfield in Soest/Bad Sassendorf (40 km East of Dortmund/Germany). 9 am to 6 pm (9 am to 5 pm Sunday). Admission is € 8.00 (children up to 13 years free). More than 100 exhibitors will be presenting their products including: engine powered planes, gliders, helicopters, jets, gas and electric engines, turbines, and electronics and Equipment for R/C models. Accommodation is available close to the airfield, you also can use the camping area directly at the airfield endowed with electricity and restrooms. For further information and details on camping accommodation check out the website at www.prowing.de

7th May '17

GBR/CAA F3A League competition. Ashbourne. All schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Visitors welcome but please contact Contest Director, Adrian Harrison on 07976 244004 for details

7th May, 4th Jun, 2nd Jul, 6th Aug, 3rd Sep, 1st Oct, 5th Nov, 3rd Dec '17

Wessex Soaring Association Monthly Slope Fly-In, for unpowered gliders and e-soarers. Saturday or Sunday, wind dependent. Slopes located in south Wiltshire, approx. 5 miles east of Shaftesbury. All welcome. Contact Pete Carpenter for details: pete.carpenter12@gmail.com or tel: 07919 903742

13th May '17

Lancing Model Show, Lancing Parish Hall, 96 South Street, Lancing BN15 8AJ. Doors open to the public from 10 am to 4 pm. Free entry, donations welcome. There will be Club Displays and Exhibits, Competition, Traders and Refreshments. Please see www.lancingmodelshow.org.uk or Email: info@lancingmodelshow.org.uk for further information

13th & 14th May '17

MULTIPLEX Airshow 2017 will again be held at Bruchsal airfield near Karlsruhe. MULTIPLEX and HiTEC team pilots from all over the world will fly demonstration schedules with their contest and display machines. Admission and parking are free. Don't forget to put the date in your calendar! Address: LSV Bruchsal - Otto-Lilienthal-Weg 1 - D-76646 Bruchsal, GPS coordinates: 49°07'59.4"N 8°33'59.2"E. Further details from www.multiplex-rc.de

14th May '17

Traplet Scale Day, at Pontefract Racecourse, off junction 32 on the M62. Start 10 am. Rules are simple – four compulsory non-aerobatic manoeuvres (including take-off and landing) to be performed with further options from a choice of 18. Which means non-aerobatic models can compete on equal terms with aerobatic models. A generous range of prizes are on offer, the only requirement is that the plane is a recognisable version of a full size fixed-wing aircraft. The winner will be the person who flies in the most authentic fashion. All pilots must have a BMFA 'A'/SAA Bronze certificate. Pilots of models weighing over 7 kg need a BMFA 'B'/SAA Silver certificate to fly at either event. Flying schedules and further information for both events can be obtained by contacting Peter Maw by Email at petermaw@outlook.com

14th May '17

F3A. BMFA 2nd GBR Team Selection Event. Hurley. FAI 'P' and 'F' schedules. Also GBR/CAA League competition. All Schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome but please contact Contest Director, Adrian Harrison on 07976 244004 for details

20th May '17

PANDAS 14th 'Free For All' Electric Fly-In, Pontefract Park, West Yorkshire. Access ONLY Junction 32, M62, Park Road turn right into WHITE GATES, and right again to site. 10 am to 4 pm. Proof of BMFA insurance essential, free flying of any electric R/C model, non 'A' certificate's can fly with supervision. Ample parking, spectators, model traders/car booters welcome. Toilet facilities. Sorry NO camping. A PANDAS member will be awarded

A FREE service, advertise your club's event, show, fly-in, bring and fly, swapmeet, sale or whatever. Simply send in the details to: 'Diary Dates', RC Model World, Traplet Publications Ltd., Traplet House, Willow End Park, Blackmore Park Road, Malvern, WR13 6NN, UK. Or Email to RCMW@traplet.co.uk Traplet Publications Ltd. are unable to take responsibility for event cancellations. Check before you go.

the Eric Johnson Electric Trophy on the day. Details pandas.bmfa.org or John Thompson on 01924 515595

20th & 21st May '17

PSSA 'Fly for Fun' event, The Bwlch, Bridgend, South Wales. Meet at the 'Ice-Cream' car park for 10 am each day. Open to non-PSSA members. Proof of insurance required. For more information contact Steve Houghton on 07762 256126 or Email: Steve.houghton59@gmail.com Further information at a470soaring.blogspot.co.uk

21st May, 2nd Jul, 17th Sep '17

White Sheet Scale Fly-In's, to be held at the White Sheet Club slopes near Mere, Wiltshire. No competition, just a friendly fly-In. Further information, directions and backup dates for each date from the calendar page of the SSUK website: www.scalesoaring.co.uk or Email: c_williams30@sky.com

21st May '17

PANDAS Sixth Single Channel & Retro R/C Fly-In, at Pontefract Park, with hosts PANDAS, (Pontefract And District Aeromodellers Society), it is located in the southwest corner of junction 32 of the M62. Access is via a huge white gate 1/4 mile south towards Pontefract. Please refer to the map provided on www.pandas-aero.co.uk and for sat nav the nearest postcode is WF8 4QD. Nothing too formal, we'll no doubt have the very popular and just-for-fun spot landing comp and a few prizes for anything special that catches our eye! On the day we will be joined as usual by the SAM35 lads, flying concurrently with the S/C and Retro enthusiasts. In fact any appropriate model from the 50s, 60s and 70s are welcome. The main objective as usual is to get everyone interested in retro-R/C flying together for equal amounts of banter, burgers, button-bashing and stick twitching! Updates and further information on www.pandas-aero.co.uk and also on www.singlechannel.co.uk. Any queries regarding location, facilities and organisation to Shaun AND Phil (please cc both). This will ensure you get a reply (or two!): museum@garritys.net or philg@talk21.com

27th & 28th May '17

F3A World Cup League Event. Criterium International du Hainaut Grandrieu, Belgium. Please contact Ashley Hoyland on 0114 2873432 for details

27th & 28th May '17

Vintage Fly-In at Shilton, Oxon. Camping available for limited number from Friday 26th after 2 pm. For more information on the event contact Nick Blackwell: nick@nickblackwell.co.uk

3rd Jun '17

Bretons MFC Swap 'n' Meet Social Evening, at the Bretons Community Hall, Rainham Road, Rainham, Essex RM13 7LP. From 7 pm till 10 pm. Emphasis is on the meet and socialising for this new event in the modellers calendar. Come along, relax and meet fellow model flyers from across the county. There will be no commission taken or booking fees. Light refreshments will be available; Tea/Coffee and BBQ (weather permitting). Entry £2. Table space for sellers is allocated on a first come basis. Contact: info@bretonsmfc.org.uk

10th & 11th Jun '17

Airborne@Summers Ponds Model Show 2017. This popular model show will be back for a 5th year at Summers Ponds Fishery and Campsite, Barns Green, near Horsham, West Sussex RH13 0PR. Airborne will once again cater for R/C helicopters and

planes, as well as control line flying in the main flying area, with FPV racing in its own dedicated field. The main show fields will cater for model boats on the lakes, R/C cars, tanks, trains, kites with other model and hobby related stalls and kiddies rides. Show times, entry fees and further details can be found here: www.facebook.com/airborne.sumnersponds, www.sumnersponds.co.uk

10th & 11th Jun '17

Bwlchfest 2017, takes place at the Bwlch, which is situated about a 15 minute drive north of J36 Sarn Services of the M4 and between Nantymoel and Treorchy in S Wales. This is a casual, 'Fly for Fun', event for all types of slope glider, be they foamy, crumchie, mouldy, F3F, sport, scale, PSS etc. Each day's event will begin at 10 am with a welcome/safety chat and go on until there isn't enough light to fly by. Information on this event is available directly from myself, Email: steve.houghton59@gmail.com or, the Facebook Group page Slope Soaring in Wales, for which an event has been set up, and also through my blog <http://a470soaring.blogspot.co.uk/>. Also see the YouTube link: <https://youtu.be/AcNMOS018GI>

11th June '17

F3A. 3rd BMFA GBR Team Selection Event. Ashbourne, Derbyshire. FAI 'P' and 'F' schedules. Also GBR/CAA League competition, all schedules. See gbrcaa.org then forum 'Competition News' for details and 'Competition Entry Form' for fees and payment. Team Selection competitors have priority entry if competition is over subscribed. Visitors welcome, please contact Contest Director, Brian Hoare 07962 358470 for details

11th Jun '17

SAM 35 Vintage R/C and Control Line Fly-In at Middle Wallop Army Airfield, Hampshire. All are welcome but please note that there will be no free flight and that only 2.4 GHz is permitted. No BMFA Certs are needed, but current membership of the BMFA is mandatory, so please have your Membership Cards with you. There may be 'Tomboy' duration competitions, if there is enough support. Control-line activities will include the 'Bee Bug Bash' and other events, plus sport flying. The Gate will open at 9.30 am, Army Museum entry charge £6 per person, plus £5 per person for SAM 35 (excepting wives, partners and children). Enquiries to David Lovegrove, Tel. 01491 200558, Email: david.lovegrove11@btinternet.com or visit www.sam35.org/events for details.

16th to 18th Jun '17

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

23rd to 25th Jun '17

UK F3A World Cup League Event. Near Ashford, Kent. International entry. Visitors welcome. Food and essential facilities on site. See www.gbrcaa.org/WorldCup/ or contact Contest Director Matt Hoyland on 07739 840498 or Ashley Hoyland on 0114 2873432 for more details

24th & 25th Jun '17

Wings and Wheels Model Spectacular, North Weald Airfield, Essex CM16 6AR. Only 2 miles from Junction 7 M11 motorway. 9.30 am – 5.30 pm. Enormous R/C Model Show with model air displays

all day with commentary from Nik Johnson, Bring and Buy for modellers, Boat Pool and indoor display, masses of Traders, R/C tanks, trucks, hovercraft, daleks and lots more! On site licensed bar and catering. Weekend camping available. All enquiries: www.wingsnwheels.net, Email: admin@wingsnwheels.net, Tel: 01242 604126

1st Jul '17

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

1st & 2nd Jul '17

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

1st & 2nd Jul '17

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

7th to 9th Jul '17

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

9th Jul '17

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

9th Jul '17

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

16th Jul '17

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

23rd Jul '17

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

30th Jul '17

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

5th & 6th Aug '17

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

6th Aug '17

Skelmersdale MAC Annual Fly-In. Low key Scale event and all are welcome. Proof of insurance required. Location is just off J4 of M58, South Exit (WN8 9TH). For more details contact: Andrew Bowman on 01942 716522, or Email: Andrew.bowman23@gmail.com

18th to 20th Aug '17

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

19th & 20th Aug '17

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

26th to 28th Aug '17

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

2nd & 3rd Sep '17

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

9th Sep '17

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

16th Sep '17

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

The Sport Channel

In this issue Gray looks at Rats, Pigs and Twigs

“The things you do for others remain as your legacy...” (Kalu Kalu)



The late Dereck Woodward often mentioned his friend John Chapis and his plans range. John is seen here with his O/D 'Pollutionless Pig XL', a scale-up of a scale-down! Original Pig was a miniature, electrified version of the celebrated 'Astro Hog'. Drop John an Email for details of his plans

This Month's Wise Words

Since our items on our late pal Dereck Woodward and his lasting legacy of model designs and priceless journalism we've received a steady stream of mail about his contribution to our hobby and his final unpublished plans that he left to me.

When Dereck emigrated to the USA he found himself in his modelling element. Electric power was advancing rapidly. He met others applying traditional skills to the new technology and model design. One of those kindred spirits, who Dereck often mentioned, got in touch recently. John Chapis, a long-time modeller and talented designer, whose plans range Dereck mentioned in glowing terms, introduced himself.

"I am proud to say, Dereck Woodward was a friend of mine. We did a lot of flying together when the opportunity presented itself. I certainly miss him.

I am pleased to see that he has not been forgotten by the modelling press. I would really love to see those unfinished designs of his published. I think it would be a fitting way to pay tribute to a great modeller.

He was quite a character to say the least and I have thought often of him while building my latest project. Enclosed you will find a picture of said project after the maiden flight. The 'Pollutionless Pig XL', eighty inches of pure fun that qualifies as 'giant scale'!

Depending on the throttle position it can putter around like a trainer, or at higher settings become a great sport aerobatic airplane. Just right for the 'older' modeller

with 64 years of model building experience.

Dereck often told me that my original 'Pollutionless Pig' (a miniature 36" span electrified 'Astro Hog' and one of Dereck's favourite R/C nostalgia designs – SC) didn't have enough of a structure. I believe that he referred to it as, 'A little bit of balsa with a lot of air in it!'

So good to hear from you, John. I can just hear Dereck offering his opinions on your model! If any SC readers would like to check out John's highly appealing designs, email him at the address in 'Contacts'.

For those wondering about Dereck's unpublished plans, which I'm hoping to complete and get published, the latest news is that it looks like they will be released via this magazine and at least one should make a free pull-out plan.

Twigging It

Regulars will already be aware that one of our favourite families of models is the ubiquitous 'Ugly Stik', originating in 1965, and all subsequent Stik/Stick variations of the iconic sport aerobatic design.

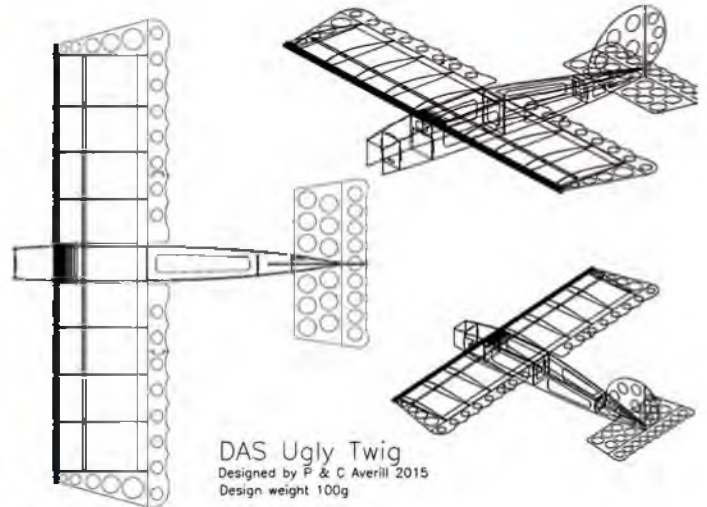
Having built a number of mini/micro Stiks it's always interesting to see how the concept gets reinterpreted today. Correspondent Steve Winnall from Melbourne, Australia

inherited a Stik project designed in the most contemporary medium:

"This Stik (renamed 'Ugly Twig') was designed on CAD by a long-time aeromodeller friend of mine. He made it to almost completion, then decided not to proceed so he gave it to me to finish. I actually flew it for the first time last evening. Only did one flight before it got dark but it went really well."

Good work, Steve, as ever. Great to see how an old favourite like the Stik can benefit from a digital make-over. Also, if anyone would like a small collection of assorted Stik plan downloads, just drop me an email.

Below left & right: Steve Winnall's 'Ugly Twig', latest in the long evolutionary line of the 'Stik' family. Steve acquired the unfinished model from a friend who'd created his own rendition of a micro Stik in CAD



Richard Grainger with his twice size scale-up of the 'Hangar Rat', one of the most popular and fun designs to emerge from the world of indoor free flight over the past thirty years.

Flight Of The Giant Rat

Much as I'd love it to be true, that's not a reference to my late night dodgy sci-fi movie habit. Since this column began I've taken many opportunities to name-check the departed but much loved U.S. publication 'Model Builder' as a major influence on my modelling career since the mid-1970s.

A favourite monthly feature from MB's outstandingly eclectic mix was the free centre-fold plan. Best known were the Peanut Scale designs of Walt Mooney and other 'names' from the U.S. indoor scale scene.

Such was their influence on their class, and indoor flying as a whole, MB Peanuts still fly in competition and for sport, even today. At one time I built an MB Peanut every month, as each was published, and had a sizeable fleet. Pity my trimming skills weren't up to much!

Whenever a non-scale plan appeared it was almost guaranteed to be eye-opening and innovative. I discovered Bostonian rubber models through MB and soon had a collection, including such splendid subjects as the 'Boston Found', 'Nieuport-Beech',

'Great Expectations' and 'Sorta Korda' (featured here some time ago). At that time, over here, they were a bit of a curiosity, but it was gratifying, some thirty years later, to see the Bostonian class finally adopted in the UK.

One plan that appeared in 1979 not only outlived MB but became something of a legend in its own right. The 'Hangar Rat' was a very simple 20" rubber powered parasol wing stick model, designed by Harry Barr and developed from an earlier commercial kit design. It was soon adopted by clubs across the world for 'single design' duration comps and aeromodelling tuition schemes for young people. Using a 'Sleek Streak' style plastic prop/bearing unit and a tiny amount of materials required for the airframe, the Hangar Rat proved to have a remarkable performance and was easy to trim.

Over the decades, Rats have been refined for even greater feats of duration, built in all sizes, variants and even converted to R/C. A British club with a longstanding affection for the design is the Nottingham MAC, who have regular competitions at their sessions. One took place back in February, which enjoyed a good turnout and also the appearance of a true giant among Rats in the form of Richard Grainger's twice size scale-up.

This 40" example flies so slowly and with such majesty and stability that all flying seems to stop when it takes to the air. You can almost count the revs of its big hand carved prop. We're including a link to a video of Richard's Rat in action so that you can see it for yourself – see Contacts.

Richard, incidentally, has the kind of aviation credentials that SC holds in awe: he's the son of one of the brothers who designed and built the famous 'Grainger Archaeopteryx' in the 1930s!

If you fancy trying your hand at Rat rearing, drop me a mail at the address at the end of this column and I'll be pleased to supply a free download of the original 1979 plan.

Riotous Assembly

Ever since we directed readers to the incomparable YouTube video of a tour of the Keil Kraft factory, we've heard some nice nostalgic stories about the 'golden age' of kit production, when machinery could be very basic but human skill and ingenuity produced the goods.

We heard from far-flung reader Steve Ralph of Devonport in Tasmania, who sent an extraordinary piece of aeromodelling ephemera. Steve writes:

"I was cleaning out a drawer today and found this insert from a Premier kit. I thought it might amuse. Although sometimes I've received kits that look like the packers were from this lot!"

I well remember Premier Balsa Products from my model shop days. They kitted their own range, plus those of the Pegasus and Olympic lines. The insert in Steve's kit shows a lovely sense of humour, with a cartoon depicting a slightly dysfunctional but very British assembly line. I built several models from all three of Premier's companies and can remember their farsighted approach to after sales service. Their text reads:

"Our highly skilled staff have all been trained at great expense to ensure that the contents of this kit are complete and of the highest possible standard of workmanship and materials; but they are after all only human. Occasionally, therefore, an odd part may be missed out or not quite up to the high standard of the rest of the kit; in which case, please notify us and the component will be replaced free of charge. We are, however, confident that you will be delighted with this product and trust that you will ask for other models in our range when purchasing future model kits and ask for Premier by name when selecting balsa sheet and strip at your local hobby shop."

Although the company's long gone, that is how you do old fashioned 'service with a smile'. I'm reminded of a couple of jokers in the model trade from those distant days. One occasionally dropped a note into his kit boxes saying: "Help – I am being held prisoner in a model factory!" I dread to think how that would be received in today's climate.

Another modeller, who built airframes to order, would, just before closing up a fuselage under construction, put a sticker inside reading: "If you can read this, you've broken it!"



Were kit production lines really like this once upon a time? We couldn't possibly comment! This charming cartoon was included in several kit lines by the Premier company in the 70s and 80s

Concorde Commended!

I've been pleased to receive so many favourable comments about our set of photos of Horst Fenchel's PSS Concorde over the Cotswolds. Most of the response has been from readers who know the special frustrations of struggling with a basic, low-res digital camera, but managing to extract surprising results. Reader, Denis Sharp expressed it perfectly:

"Sometimes simpler cameras are better. I used to have a cheap digital camera with fixed focus but of low resolution. Now I have a more complex camera but taking photos of flying objects is more difficult in some respects because the auto focus on the camera sometimes tries to focus on a cloud a mile or so behind the model!"

How I sympathise, Denis. My newest camera can produce occasionally stunning images, though I have very little say in the matter! It has functions that I've yet to access and it mostly takes the shot that it wants to take, rather than mine. It also saves shots in huge file sizes; this poor old PC nearly grinds to a halt while transferring them!

The most wryly amused reaction to the Concorde was prompted by its British Airways livery. My long time friend Juliet worked for BA in the 1980s as cabin staff on internal and European routes. I've always admired the optimism and tenacity she showed in joining the company in the hope of rising through the ranks and becoming a pilot – a route not available to women in those days.

When she saw a BA Concorde cavorting over Cheltenham she immediately grasped what a sensational sightseeing experience such a flight would have given and said she would have gladly transferred to the route – bothersome environmental issues notwithstanding!

Contributions, please to The Sport Channel c/o the Traplet Publications address.

All e-mail correspondence to: gray_rcmag@hotmail.com **RCMW**

CONTACTS

JOHN CHAPIS PLANS:
chapisplans@comcast.net
GIANT HANGAR RAT VIDEO
youtu.be/6ZPbJazsu_E



We didn't have space to include this shot of Horst Fenchel's Robbe Concorde over the Cotswolds previously. In this study, it's heading off to visit Bishop's Cleeve. Our haphazard photographic methods gained a surprising level of approval. Even ex-British Airways staff were impressed!

THIS MONTH WE FEATURE WWI FIGHTERS

RAF SE5A



RAF SE5A

Wingspan: 73"
Radio Functions: 4
Scale: 1:4.36
Designer: Duncan Hutson
Plan Code: MW3290
£45.50 + P&P

Woodpack & parts available!



New Product!

Available to purchase with the RAF SE5A plan is a bespoke additional woodpack, containing all the sheet and strip wood needed to complete the construction of this iconic aircraft.

Product Code: AWP3290 **£55.80 + P&P**

WWI FIGHTERS

Nieuport 12



Wingspan: 68"
Radio Functions: 4
Scale: 1:5
Designer: Martin Irvine
Plan Code: MW2791
£20.50 + P&P

Airco DH-2



Wingspan: 56.5"
Radio Functions: 4
Scale: 1:6
Designer: David Hurrell
Plan Code: MW3315
£22.50 + P&P

Parts available!

BE 2C



Wingspan: 74"
Radio Functions: 4
Scale: 1:6
Designer: David Hurrell
Plan Code: MW2907
£27.50 + P&P

Parts available!

Bristol Scout



Wingspan: 49"
Radio Functions: 4
Scale: 1:6
Designer: David Hurrell
Plan Code: MW2020
£22.50 + P&P

Fokker Dr.I



Wingspan: 71"
Radio Functions: 4
Scale: 1:4
Designer: David Hurrell
Plan Code: MW3005
£27.50 + P&P

Albatros



Wingspan: 76.5"
Radio Functions: 4
Scale: 1:6
Designer: David Hurrell
Plan Code: MW3225
£22.50 + P&P

Parts available!

Fokker D.VIII



Wingspan: 54"
Radio Functions: 4
Scale: 1:6.5
Designer: Peter Miller
Plan Code: MW3599
£22.50 + P&P

Woodpack available!

Halberstadt DII



Wingspan: 58"
Radio Functions: 4
Scale: 1:6
Designer: David Hurrell
Plan Code: MW2044
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MG 08/15 'Spandau'



Available Scales: 1:4, 1:5, 1:6
Product Codes: 3D044, 3D045, 3D046
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Wingspan: 90"
Radio Functions: 4
Designer: Sepp Uiberlacher
Plan Code: MW3624
£27.50 + P&P

Parts available!

Avro 621 Tutor



Wingspan: 68"
Radio Functions: 4
Designer: Dennis Bryant
Plan Code: MW3441
£28.50 + P&P

Woodpack & Parts Available!

De Havilland DH82 Tiger Moth (70.5")



Wingspan: 70.5"
Radio Functions: 4
Designer: Mick Harris
Plan Code: MW2119
£27.50 + P&P

Parts available!

Miles M.14 Magister



Wingspan: 68"
Radio Functions: 4
Designer: Dennis Bryant
Plan Code: MW3446
£27.50 + P&P

Woodpack, Parts & Photo CD Available!

De Havilland DH82A Tiger Moth (66")



Wingspan: 66"
Radio Functions: 5
Designer: Dennis Bryant
Plan Code: MW3460
£27.50 + P&P

Woodpack & Parts Available!

DCH-1 Chipmunk



Wingspan: 68"
Designer: Dennis Bryant
Plan Code: MW3444
£27.50 + P&P

Woodpack, Parts & Photo CD Available!

North American AT-6 Texan / Harvard



Wingspan: 94.5"
Radio Functions: 6
Designer: Brian Taylor
Plan Code: MW3336
£27.50 + P&P

Woodpack, Parts & Focus CD Available!

Grob 115E Tutor



Wingspan: 36"
Radio Functions: 4
Designer: Giles Fowler
Plan Code: MW3188
£13.50 + P&P

PT-19



Wingspan: 62"
Radio Functions: 4
Designer: Herman Grobler
Plan Code: MW2857
£19.50 + P&P

CIVILIAN AIRCRAFT

Fokker F-XVIII



Wingspan: 74"
Radio Functions: 4
Designer: Laddie Mikulasko
Plan Code: MW3738
£23.50 + P&P

Woodpack available!

Mini Cab



Wingspan: 75"
Radio Functions: 4 + Flaps
Designer: D Womersley
Plan Code: MW2001
£27.50 + P&P

Woodpack available!

Miles M.2L Hawk Speed Six



Wingspan: 86"
Radio Functions: 4
Designer: Phillip S Kent
Plan Code: MW3117
£25.50 + P&P

Woodpack available!

Kriekraft Akromaster



Wingspan: 48"
Radio Functions: 4
Designer: Traplet
Plan Code: MW2632
£16.50 + P&P

Parts available!

Fairey Topsy Trainer



Wingspan: 84.5"
Radio Functions: 5
Designer: Maurice Thompson
Plan Code: MW2465
£20.50 + P&P

Photo CD available!

Chilton DW1



Wingspan: 53"
Radio Functions: 4
Designer: Dereck Woodward
Plan Code: MW2081
£17.50 + P&P

Photo CD available!

Amethyst Falcon



Wingspan: 36"
Radio Functions: 4
Designer: Roger Vaughan
Plan Code: MW3554
£13.50 + P&P

Woodpack available!

Dalotel DM-165



Wingspan: 57"
Radio Functions: 4
Designer: Peter Miller
Plan Code: MW3541
£19.50 + P&P

Woodpack available!

Percival Q6 Petrel



Wingspan: 112"
Radio Functions: 5
Designer: Robin Fowler
Plan Code: MW3514
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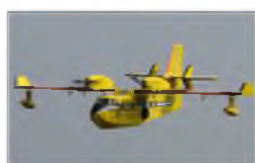
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1/3 uncovered airframe of Mike Smart PITTS S1, £250. 1/5 85" P47 airframe with retracts and new MDS.218 motor, £550. Call Glenn 07460457280. Portsmouth.

Spektrum RX Two AR600 and Two AR610 RX, little used with instructions and bind plug, £25 each plus postage. Call 02392 594661. Hampshire. Email: johnwheeley@radhaus.uk

Star Max F4E Phantom EDF, wingspan 542 mm, requires 3 cell 1300 LIPO. Complete with 3 servos and ESC, minor cosmetic damage. Buyer collects, £40. Call 02392 594661. Hampshire. Email: johnwheeley@radhaus.uk

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Galaxy Aerojet 540. Two new complete boxed kits, £35 for each kit, plus postage. Call 02392 594661. Hampshire. Email: johnwheeley@radhaus.uk

Junkers D.1 Balsa USA 1/4 scale kit, untouched. Buyer collects. £280. Call Colin on 01508 528084. Norfolk.

Spektrum DX6i 2.4 GHz transmitter with recharge battery installed. Plus 2 Spektrum AR610 6 CB. receivers. Boxed-unused. Can post at extra cost or buyer collect. £90 Ono. Call Bill on 07740096246. Lancs.

Davies Charlton 049 Wasp engine, boxed with silencer VGC, £25. Enya 6002 40. RC engine with silencer, £15. Frog 150 diesel VGC 45. Bantam VGC, £15. Call 07909 766687. Suffolk.

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2 X O.S.46LA. Boxed / VGC, £35 each + postage. 2 X O.S.40LA. Boxed / VGC, £35 each + postage. 2 X O.S. 40FPS, NNIB. £40 each + postage. Age related sale. Call 01157 795869. Nottingham.

Fantrainer 50" takes off dolly. F/ Glass finishe, sprayed grey yellow. Show class build, requires 80 Amp ESC 4S 2200 Lipo. £175. Phone 01522 533147. Lincoln.

WANTED

Wanted plan for Titus by Steve Vine. Call 02084 459567. London.

Wanted Precedent Electrafly, 88" glider kit. Phone Gary 0777 9897033. Notts.

Wanted. Balsa U.S.A. third scale Piper Super Cub plans please. Phone 01952 603574. Telford

Swot model aircraft, new engine, not been flown. Extras flight box. Swap for Piper Club kit, small wing span. Call 01522 807069. Lincoln.

Magazine, Model World 2005 Special Issue, mine is missing Martin Ma-1 plan. Email: mertatmbf@comcast.net. Call Merton (059) 228-9517. WA. U.S.A.

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Wassmer WA-22 Super Javelot



Scale glider designs from Chris Williams are always well worth waiting for and his latest scale soarer is sure to be well received. The slightly unusual wing dihedral makes this French single-seat glider stand out from the crowd, whilst the optional E-assist converts it to a model for all occasions – very useful when the wind drops on the slope! Scaled at 1:3.25, the Super Javelot spans 4.6 m and weighs in at 9 kilograms (20 lb).

Shrike



Bill Bowne's latest addition to our free plan range is a 51 - inch (1295 mm) wingspan high-wing EP sports model. Designed around readily available 15 size brushless motors, such as the E-Flite Power 15, this model provides a spirited aerobatic performance using a 4S-2200 mAh LiPo. Control is via the throttle, rudder, elevator and ailerons (using dual servos), while the built up airframe is made from traditional materials: balsa, spruce, ply and lite-ply.

JUNE 2017 ISSUE ON SALE THURSDAY 18TH MAY

Roban Bell 212



Martin Briggs fits one of Roban's highly detailed Bell 212 scale bodies to a set of 800 size helicopter mechanics. In his review, Martin concentrates on the fuselage aspects of this finely detailed 212, covering any changes that he felt necessary to make during its assembly. Finally, he outlines his findings after the first lift-off and subsequent flights. Having recently seen the model in the air at our local flying site, trust us when we say that it's a real beauty and sounds fabulous – dare we say even better than the turbine heli that Martin was also flying that day!

PLUS...

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*All contents are subject to change without notice

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Pegasus Models



P-51D Mustang Kit

Part: A-SFM8629K
SSP: £149.99

Specification:

Wingspan: 1426mm (56.2")

Length: 1177mm (46.3")

Weight: 2.3kg (5lbs)

Radio System: 4 - 6 Channels (Required)

Servos: 4 - 7 Standard (Required)

Electric Motor: Quantum II 40
Brushless (Recommended)

ESC: Quantum 60A Brushless
(Recommended)

LiPo Battery: Hi-Energy
4S 3200mAh
(Recommended)

Piper J-3 Cub 40 Kit

Part: A-SFM867K
SSP: £99.99

Specification:

Wingspan: 1720mm (67.7")

Length: 1095mm (43.1")

Weight: 2300 - 2600g (5 - 5.7lbs)

Radio System: 4 Channels (Required)

Servos: 4 Standard (Required)

I/C Engine: .40 - .70 4-Stroke (Required)

Electric Motor: Quantum II 40 Brushless
(Recommended)

ESC: Quantum 60A Brushless
(Recommended)

LiPo Battery: Hi-Energy 4S 3200mAh
(Recommended)



Fokker DVII EP Kit

Part: A-SFMEP46K
SSP: £109.99

Specification:

Wingspan: 1200mm (47.2")

Length: 950mm (37.4")

Weight: 1.7kg (3.7lbs)

Radio System: 4 Channels (Required)

Servos: 4 x Mini (Required)

Electric Motor: Quantum II 36 Brushless
(Recommended)

ESC: Quantum 60A Brushless
(Recommended)

LiPo Battery: Hi-Energy 3 - 4S 2700-3200mAh
(Recommended)



Example of kit contents

Traditional Balsa Kit Range

Noticing a lack of traditional wooden kits in the market Super Flying Models decided to release their popular Fokker DVII in kit format to great success. Since then SFM have expanded the kit range to include an IC/EP Piper Cub based on their existing ARTF and this handsome new P-51D Mustang kit also suitable for IC/EP power. With step-by-step instructions, an interlocking structure, a comprehensive hardware pack and precision laser cut parts any one of these models would make a great introduction into kit building.